Amateur Radio

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—Photograph courtesy George Brzostowski VK1GB

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All copy for inclusion in the November 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, September 16, 1988.

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News Editor's Guest Editorial

What is the role of Amateur Radio *magazine?* It is not until you really think about that question do you come to realise the multi-faceted role served by the WIA journal.

From the first edition in 1933 it has been primarily the medium for dissemination of information to radio amateurs and shortwave listeners.

Being the official journal of Australia's national radio society, it also becomes the voice of the WIA.

The Macquarie Dictionary defines "journal" as being any periodical or magazine, especially one published by a learned society.

The first editor, Harry Kinnear, and the inaugural WIA Victorian Division based magazine committee saw the need for the Institute to have a journal and set the foundations still being followed today.

The magazine provides a venue for the interchange of ideas between members and feedback on developments affecting our hobby.

The devolvement of amateur examinations is a current issue on which members views can be aired through the pages of AR magazine.

There are others, like restructuring of the licence system and future directions of our hobby.

The advertisers in AR magazine are effectively showing their market what they have to offer, and get a worthwhile response for their advertising dollar.

Reviews of equipment and other products keep readers up with the latest available.

The ever-popular Hamads service helps recycle used equipment. Members can also call for help when they need a particular component or circuit diagram. It really works!

Clubs and groups have always had a slot in the magazine for news on their activities.

The WIA Divisions are able to effectively communicate with their members via monthly columns.

But the Divisions are also news-gatherers for the journal. They look for, and encourage, their members to submit general interest or technical articles.

Being a technical or scientific hobby, the magazine is an ideal place for WIA members to publish technical papers on their experimentation or discoveries.

An innovation which began two years ago, Technical Mailbox, is giving members the opportunity to seek authoritative solutions or answers to their technical problems.

The journal promotes both the technical side and hobby communicator aspects of amateur radio.

The community service provided through WICEN and Third Party Traffic handling is also part of the editorial menu.

It aims to cater for both the newcomer and old hand in the hobby.

While it is not always possible to satisfy everyone, the WIA Publications Committee and the regular columnists try to cover the various activities within the hobby.

Awards, CW operating, Shortwave Listening, DX, VHF, Contests and Satellites are examples of the broad range of interests covered.

There are plans to publish articles on Foxhunting and Packet Radio, (see elsewhere in this issue) and other possibilities are under review.

AR magazine is read more widely than just by the WIA membership, which receives a copy mailed each month. Many non-members see the magazine through members who pass it on, or at club meetings.

These potential members will be targetted in the magazine with frequent recruitment material including details of services available to members.

Influential people including cabinet ministers and government department heads get the WIA journal, giving it an important public relations role.

Our hobby is an international one, and global decisions ultimately affect the Amateur Radio Service in Australia.

The WIA is an active member of the International Amateur Radio Union (IARU), and regular reports on the international events appear in this magazine.

Our monthly publication is admired by the WIA's sister national radio societies who often praise its content.

The RSGB, ARRL, and the doyen of 73 magazine, Wayne Green W2NSD, have been among those who have offered unsolicited congratulations.

AR magazine is often directly quoted by overseas publications, and occasionally articles written by WIA members are re-printed with full credit in other magazines.

A less obvious role for this long-running publication is that it is an historical record. Collections of every edition published are available as a history resource.

You now have in your hands a publication which is more than a mere magazine.

Jim Linton VK3PC
News Editor
ar

WIA QSPs TO MEMBERS

Federal Office Staff

I would like to tell you something about the staff in the Federal Office. Many of you will know by now that Ann McCurdy is back with us, but in a part-time capacity after her serious operation. Ann provides secretarial assistance to the General Manager. There are three other part-time workers — June Fox, who is responsible for the accounts and advertising for *Amateur Radio* magazine, Helen Wageningen, who is responsible for the membership records and AR circulation, and Earl Russell VK3BER, who looks after the membership computer system.

The other worker in the Federal Office is Bill Roper VK3ARZ, whose voice is well-known to you. Bill joined the Federal Executive in April 1987 and took over as acting-treasurer last November. During the December to April period, he spent a considerable amount of time reviewing certain aspects of the operation of the Federal Office, particularly those associated with the financial side of things. As a result of this review, Bill has commenced setting up a number of new office systems, which include a new accounting system.

Since May this year, Bill has been working in a temporary capacity as the General Manager and Secretary of the Institute. He is currently on long term leave from his current employer and because of this arrangement, very little publicity has been given to his employment through WIA channels at Bill's specific request. This temporary employment arrangement will conclude sometime during September, by which time the Federal Executive hopes to be in a position to make a full time appointment to this position.

Peter Gamble VK3YRP
Federal President
ar

Survey of Amateur Radio Readers and Members of Your Society

The Wireless Institute of Australia is basically a service organisation and, in keeping with most similar organisations in our community, is currently examining its reasons for existence with a view to deciding its future direction.

As with most other leisure-time activity groups in our society today, the WIA is experiencing some difficulty in keeping pace with the rapidly changing perceptions and expectations of its members.

Amongst other things, it is experiencing problems caused by members finding increasing difficulty, due to the increasing demands on their leisure time, in performing the many voluntary tasks needed to keep the Institute functioning. And the difficulties caused because these same members, more affluent now then when they had time to spare, are reluctant to pay higher membership dues to enable professionals to take their place and perform these necessary duties.

Like most service organisations, in the past the WIA has tended to be a systems driven organisation, delivering established services because that was what was available, and being rather slow to respond to the members changing needs.

Following modern commercial practice, we are now turning around and changing to a customer driven organisation. An organisation that provides what its members want.

As we gear up to produce a new corporate plan, a blueprint for the future, we need your help to ensure that we plan wisely for the future. We want you to tell us what **you** want and expect from **your** Institute.

A survey of members will be included in the October 1988 issue of *Amateur Radio* magazine. Among other things it will give you the opportunity to tell us what you think we do well, what we do poorly, and where we should be placing the emphasis in the future.

Another part of the survey is going to gather data to enable the Institute to produce a statistical model of the readership of *Amateur Radio* magazine. This will enable us to demonstrate to advertisers the worth of advertising in our magazine.

And yet another part of the survey will help the Editor and the Publications Committee to better tailor *Amateur Radio* magazine to its readers requirements.

To encourage a maximum response from members there will be a number of valuable prizes available to be won by those who return the completed survey.

Full details will appear in next month's *Amateur Radio.*

ar

OH NO, NOT ANOTHER LOG KEEPING PROGRAM!

Kevin Feltham VK3ANY
109 Mary Street, Morwell, Vic. 3840

This article discusses computer programming principles, using a log keeping program to illustrate some of the principles discussed. Home-brewing is all but extinct in amateur radio. Computer applications can provide an outlet for the creativity and ingenuity of amateurs and help fill a void left by the demise of home-brewing.

There has been a plethora of amateur station log keeping programs in the amateur literature since personal computers first appeared in amateur shacks. In the July 1987 issue of *Amateur Radio* there were no less that three log keeping programs, two written in BASIC and one in PASCAL. Once amateurs acquire a new computer they usually like to try their hand at programming. Most go through the stage of writing relatively simple number crunching programs to compute aerial parameters, satellite predictions and so forth. A log keeping program is a natural progression into a more ambitious programming effort in the field of data handling as opposed to simple calculation.

Personally, there seems little need for a log program, except possibly for contest applications or for the dedicated DXer. In any case, a log application can usually be quickly developed using one of the database systems such as dBASE 3®. However, using a procedural language such as BASIC or PASCAL to write a log program from scratch provides good programming experience in data manipulation, data structures and input methods.

CHOICE OF PROGRAMMING LANGUAGE

Most beginning programmers give no thought to which computer language to use. BASIC is the natural choice as it is easy to learn and is provided with virtually every personal computer. It has many features and can accomplish most tasks. In the *Hewlett Packard* implementations it is particularly good for technical applications. However, while it is possible to write good readable programs in BASIC, it is also possible to write hopelessly unreadable ones!

Languages such as PASCAL and MODULA 2 offer many advantages over primitive languages such as BASIC and FORTRAN. They offer a variety of data structures which are not available in BASIC and FORTRAN and encourage, indeed almost force upon the programmer, good program design. Because of the strong data typing, declaration of variables prior to use and the use of global and local variables, it is easier to write programs that are free of subtle bugs that show up some time after the program has been placed in service. Bugs usually show up early in the testing phase.

The author's language of choice is now PASCAL, or more particularly TURBO PASCAL, for microcomputer applications. TURBO PASCAL, under MS-DOS, is used on a PC/XT clone. It is also available for CP/M machines and, I believe, 68000 based machines. TURBO PASCAL has many extensions over the standard PASCAL in the areas of file handling, bit manipulation and string handling. The MS-DOS implementation also gives access to system interrupts and BIOS routines. As such it is far from a standard implementation of PASCAL although on microcomputers, it is almost a standard in its own right. TURBO PASCAL also comes with an efficient text editor which makes writing the source code easy.

Changing from BASIC to PASCAL is roughly equivalent to the change which was made from AM to SSB. It seems difficult at first, but once the change is made there is no going back. (The author is looking forward to trying MODULA 2, a language which is a development of PASCAL).

DATA STRUCTURES

The advantage of using PASCAL is the great variety of data structures that it is possible to use. In BASIC or FORTRAN the most complex data structure available is the multi-dimensioned array. PASCAL offers standard data types such as the record, set and the pointer as well as those found in other language. Also, the programmer can define his own data types using the standard data types. This allows the building of complex data structures which are ideally suited to data manipulation applications. For example, each element of an array may itself be another array. Records may contain fields which are themselves records, or arrays, or arrays of records. This article does not intend to be a tutorial on data structures, very large books are available on this subject alone, but rather to point out their availability and to encourage the reader to explore their use.

A particularly powerful feature of PASCAL is the availability of pointer variables. When combined with records these permit the building of dynamic data structures which are the secret to rapid data retrieval and database applications such as a log program.

A disadvantage of arrays when using compiled programs such as FORTRAN or PASCAL is that their size must be known at compile time. Therefore enough memory must be allocated to the array to cater for the largest size likely to be used. In many cases the array is seldom completely filled and the unused memory is unavailable for other use. Dynamic data structures overcome this by allocating memory only as it is required, and freeing this memory for reuse when it is no longer needed. The reader who is at all interested in programming is encouraged to study the use of pointer variables and dynamic data structures.

AND NOW, THE LOG PROGRAM

The three log programs previously mentioned all kept the entire log in memory. This may be alright for a contest, but is not of much use to the keen DXer who wishes to have instant retrieval from a log containing thousands of contacts too large to fit into the computer memory. Also, a glitch on the power lines can wipe out the entire log. This means that the log must be frequently saved to disk which can be a nuisance during a contest, and in any case, is not the complete answer. The size of the log is also limited by the computer memory. What is needed is a log which is kept on disk at all times with some means of instantly finding the correct record on the disk, and retrieving just that record.

The author has written a log program which is a development of an earlier program written in BASIC. In both programs the logs are resident on disk. As a new contact is entered, it is written immediately to disc. Both programs work well and, as far as the user is concerned, they function identically. The difference is in the speed of retrieval of a particular contact. The PASCAL version retrieves the correct record virtually instantaneously, the only delay being the time it takes to read a disk sector into the buffer. The BASIC version is virtually unusable with a large log because of the time taken to retrieve the disk record.

The only difference between the two programs is the method used to find the disk record containing the desired contact. The BASIC version uses a sequential search, the PASCAL version uses a dynamic data structure known as a B-Tree kept in memory to reference directly the required disk record.

The three log programs previously referred to all keep the contact data in string arrays. The author of the program written in PASCAL mentioned that a record type data structure would have been preferable. This is indeed true as it makes the program much more readable, and reading and writing to disk more efficient.

The fact that the log is kept on disk means that a computer with a relatively small memory can handle a large database. The only limit is disk capacity and any limitations on the number of disk records that can be accessed imposed by the language being used. With TURBO PASCAL, 64K records can be addressed if integer record numbers are being used. It is possible to use real numbers to address records which overcomes this limitation.

The program I have written is a general purpose program, ie it is suitable for the DXer. It can be used for contests as is, but it could be optimised for contest use by removing some of the options and reducing the depth of menus. Provision could also be made for automatically entering the time and date from the system clock, which has not been included in the

present program but is easily implemented. These modifications will speed up data entry during contests.

The program has been designed to be as foolproof as possible. All data entered is checked for validity, and the entry of incorrect data should not crash the program. The operation of the program should be clear from the menus and screen prompts without any supporting documentation. Various methods of searching the log are possible. A search can be initiated for a call sign, prefix or partial call sign. A search can be for all contacts in the log, or on a particular band, before a certain date, after a certain date or between dates. A search can also be made for all contacts on a particular band. The entire log can also be printed out. Output can be to the screen or printer.

The program was written as an exercise in database handling and program design rather than because I desperately wanted a log program. Much has been learned from writing it and there has been great satisfaction gained from the way in which it works. The fast disk access depends upon having a tree structure in memory which indexes the database on disk. This tree structure is a B-Tree, based on the binary tree, but with modifications to maintain a better balance. To learn more about tree structures it will be necessary to attain a good book on data structures. The index is also stored on disk and read into memory when the program is started. It is updated as modifications are made to the database.

PROGRAM DESIGN

First, it is necessary to write down what functions the program is required to accomplish. In this case, a menu driven program to carry out the following functions was required:

- Enter new contacts into the databases
- Search for a call sign
- Search for a prefix
- Search for a particular band
- Print the entire file

This leads to the following PASCAL program.

```
begin {Main program}
  Initialise;
  repeat
    Menu (Option);
    case Option of
      '1' ; Enter—New—Contact;
      '2' : Search—For—Call sign (Option);
      '3' : Search—For—Call sign (Option);
      '4' : Search—Band;
      '5' :Print—Entire—File
    end; {case}
  until Option = '6';
  CloseFile (QSO—File);
  CloseIndex (QSO—Index);
  clrscr;
  writeln ('AMATEUR STATION LOG PROGRAM TERMINATED!')
end. {Amateur—Station—Log}
```

That's it! The entire main program! The first step in program development is to type the program in as above using the text editor. As can be seen, the program calls eight procedures — Initialise, Menu, Enter—New—Contact, Search—For—Call sign, Search—Band, Print—Entire—File, CloseFile, CloseIndex.

These procedures are placed ahead of the main program, easily accomplished with the TURBO PASCAL text editor. A procedure is similar to a subroutine in BASIC, except that they are called by name, not line number, and it is possible to pass parameters to procedures. Of course, it is still necessary to write the procedures to do the actual work, but these can be written exactly the same way as the main program. That is, write down what they are to accomplish, write the procedure in outline as above, and if necessary use other procedures to accomplish specific tasks. Procedures can be nested within other procedures. In this way the writing of the program is gradually broken down into small parts, which taken individually, are easy to code.

After the main program is finished, dummy procedures can be written to test the program. In the case of the procedure Initialise, this would be:

```
procedure Initialise;
begin
end;
```

At this stage the procedure does nothing. Similar to a subroutine in BASIC consisting only of a RETURN statement.

The procedure Menu returns a parameter to the main program so it would be written as

```
procedure Menu (var Option : char);

begin
  Option := '6';
end;
```

Notice that Option is a character variable, not numeric. In the main program the variable Option is used, so at the beginning of the program include the variable declaration:

```
var
  Option ; char;
```

Now compile the program. It should compile and run. The program will do nothing at this stage except print the closing message on the screen. This proves that the logic of the program is correct and it now only remains to fill in the details in the individual procedures. As this process proceeds it is usually found that there are further global types and variables that need to be included. This is simple to do as program development proceeds.

You will find that local variables are also needed in most of the procedures. These may have the same names as in other procedures or the main program, but no confusion will result because PASCAL keeps all these variables separate from each other. This is one of the reasons it is easy to write bug-free programs in PASCAL. Procedures used frequently in various programs can be written and included in programs without modification, without fear of variable names clashing. Try that in BASIC and see what happens?

INDEXING THE DATABASE

At this stage, I must confess, I cheated. Although I have programmed binary trees before, Borland, the creators of TURBO PASCAL have made it easy. They produce a series of routines on disk called *Turbo Database Toolbox*. This contains all the procedures necessary to implement B-Tree indexing and to write quite sophisticated database applications. The necessary procedures are supplied in source code form and are included in the program at compile time. The routines are very easy to use and well explained in the documentation.

It will be necessary to include several constant declarations at the beginning of the program which are used by the indexing routines. These vary depending upon the nature of the records in the database and require a little bit of thought to achieve optimum results.

It is possible to have more than one index file in each database, and to have several data files. In the log program there is only one index file and one data file. It is necessary to decide on the structure of the records in the database. In my case, I made the following type declaration to store contact information.

```
type
  QSO = record
    Call sign : string [10];
    Date : string [8];
    Time : string [5];
    Band,
    High—Band,
    Low-Band : real;
    Mode : string [6];
    Report : string [3];
    Remarks : string [40]
  end; {record}
```

This creates a user defined data type called QSO. In the variable declarations it is now necessary to include a variable of type QSO, eg

```
var
  Contact : QSO;
```

The variable Contact can then be manipulated as any other single variable, ie equated with other variables of the same type, read or write from disk, etc. This is even though it consists of several fields which can be accessed individually. Note that all fields are strings, except three which are real numbers. The reason for this will be explained later.

As in any other database, one of the fields of the record must be a key. In this case it is the Call sign field. But, there is no reason why there can not be more than one index file using say the Band or Date fields as keys. This provides more options and greater versatility for searching but did not seem warranted in the present application.

INPUT VALIDATION

This is an important consideration in a program. In PASCAL, as in most languages, if the program pauses waiting for input from the keyboard, it will crash if a non-numeric character is entered when a numeric value is expected. This sort of thing should be guarded against by inputting all data as character strings, and converting to numeric values after checking the input. If non-numeric characters are included, then the program should prompt for re-entry of the data before proceeding.

If a date is being entered, the validity of the date should be checked. For example, the day field is entered first. If the day is not in the range 1 to 31 then the program will not proceed until a valid number is entered. The month field is entered next. If the month is valid, that is in the range 1 to 12, then the day is checked again to see if it is valid for that month. Again, the program will not proceed until the date is valid to this point. When the year is entered it is checked to see if it is a leap year. This determines the number of valid days acceptable for February. With all this checking, it is not surprising that the procedure for date entry is one of the longest single procedures in the program. But this is an indication of the sort of input validation that should be undertaken. A similar process is used for entry of the time.

In a contest log, date and time would be taken from the system and entered automatically to save time. However, in a general purpose program it is better to enter them manually. The program can then be used to enter previous log information into the database at any time.

Incidentally, this means that the program can be put into use immediately to enter current contacts, and old contacts entered at any convenient time to bring the database up to date. Contacts do not have to be entered in chronological order.

The Contact record has three fields for the frequency, Band, High—Band and Low—Band. This is to cater for the many ways in which the frequency of operation is likely to be entered and to make the program as foolproof as possible. For example, in some cases the actual frequency of operation may be entered. In other cases the frequency of the bottom end of the band may be entered. Some people enter 146 when working on the FM portion of two metres or 144 when working on the gentleman's end of the band. With this program it does not matter. The frequency is entered as a string of characters, and then converted to a number. If an error occurs the program loops until a valid number is entered. This number is used to compute two further numbers, one above and one below the number entered. These numbers are chosen so as to include the whole of the band being worked, plus something to spare at each end.

The reason for the above is that when searching for contacts in a particular band, any frequency within the band can be entered as a search parameter. The contact will then be found so long as the search frequency is within the limits of the high and low frequencies previously computed. This gives the operator freedom to enter the frequency of operation in the form preferred, and it is not necessary to remember how it was originally entered to be able to retrieve the information.

As can be seen, input validation is an extremely important part of program development, more important than at first seems. Most programmers spend much time getting the logic flow of the program right, and pay only passing attention to data input routines. It is extremely frustrating to have a program halt with an error message when a wrong key is pressed entering data. A little attention to detail can avoid this and you conclude with a virtually crashproof program.

DATA OUTPUT

Attention should also be given to the data output routines. The log program offers a choice of output to screen or printer. In general, the same procedures are used for both outputs, with different branches being taken at different points in the procedure according to which output option was selected. For example, when printing to the screen, the display pauses when the screen is full. When a key is pressed, the next screen of information is displayed. When outputting to the printer, printing is continuous, but the perforations between pages are skipped.

When printing the entire log, the log is printed in alphabetical order of call sign. This suits me and is an automatic result of the B-Tree indexing. If output is required in chronological order, then a second index would have to be set up where the date was the key field instead of the call sign. When selecting the output option another menu option would then be required to specify chronological or alphabetical order.

CONCLUSIONS

The log program discussed in this article was written mainly to try out certain programming and database principles. The project was a success in that the resulting program performs very well and achieved all of the initial aims. It has proven the viability of having a disk based rather than a memory based log program which allows rapid retrieval while not being constrained by the memory size of the computer. If a hard disk system is used, retrieval is virtually instantaneous and still very quick with a floppy based system.

The importance of foolproof input routines was amply demonstrated during the development phase of the program. Even after the logic of the program was well and truly sorted out, unexpected effects still sometimes occurred when entering data. It is important that the user be given a chance to review and alter the data before it is committed to disk.

The advantage of using a language such as PASCAL was very obvious during the development stage. Each function of the program can be developed and tested independently. Once a procedure is developed and running correctly, you can then work on developing the next stage of the program knowing that it will not upset anything that has already been done. By developing and debugging the program in small stages, the final program worked with a minimum of testing and debugging being necessary.

The author can recommend that any amateur seriously wishing to develop their programming skills consider using TURBO PASCAL or MODULA 2. as a programming language. The limitations of BASIC and FORTRAN are too inhibiting and slow down programming development. The use of PASCAL greatly reduces program development and debugging time. Remember what the B in BASIC stands for! Of course, there are some projects for which PASCAL is not suitable, such as a program to turn the computer into a TNC for packet radio. Only assembler can cope with that sort of project, but if you are that far into computers, this article will be of little use to you!

The listing of the program is not given here because of its length. It does not include the Turbo Access routines because they are copyright and cannot be freely reproduced. If you wish to type in this program yourself it will be necessary to purchase the Turbo Database Toolbox, as well as obtain the listing from me. Alternatively, I can send anyone interested in the program an MS-DOS formatted disk with the compiled program and the source code (less the Turbo Access routines) for a cost of $20 which includes the cost of the disk, postage and packaging. I would need to know the disk drive on which you intend to store the data.

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It pays to advertise! Advertise your product or yourself in Amateur Radio.

QSP

1988 SEOUL SUMMER OLYMPICS

Some of the special event stations that will be active from September 17, are 6K24SO, 6K88SO and 6K88BYC. Stations may be operated by visiting licenced amateurs and there will be special QSL cards and awards for these and other stations which will be operating unique prefixes and suffixes.

—Condensed from *CRRL News* by Ken McLachlan VK3AH

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FRAUD

Eleven amateurs in Puerto Rico face possible revocation of their amateur privileges, as the US Federal Communications Commission (FCC) charges that they were involved in fraud by using their roles of Volunteer Amateur Radio Examiners.

The FCC became suspicious when the licence growth of amateurs in Puerto Rico exceeded 50 percent. The average growth in the United States of America over the same period was only three and a half percent!

—Condensed from *CRRL News* by Ken McLachlan VK3AH

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HAVE YOU GOT THE TIME?

In America, the National Bureau of Standards has established a "time-by-modem" for the computer buff. The service is generated in 300 or 1200 baud. Dial the allocated number and hit the ? key and the correct time is generated on the screen to set your computer's clock. Quite an innovation and money spinner. Telecom please take note.

—Condensed from *The ARRL Letter* by Ken McLachlan VK3AH

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UK CONSIDERS NOVICE LICENCE

RSGB Secretary, David Evans G3OUF, says the encouragement of more newcomers is essential for the well-being of amateur radio.

Writing in the RSGB journal *Radio Communication* he says one key to the future is to develop a new type of licence to give beginners practical "hands-on" experience.

Work is underway to develop a beginners licence grade giving access to a few amateur bands, with mode, power and possibly antenna restrictions.

Those in the 11 to 16 age group perceive the typical one year training period which might involve 150 hours of classes needed to pass the current radio amateur examination is too long.

The RSGB is developing a new licence designed around a 30 hour course plus the time for Morse code training at six words-per-minute.

WRIST WATCH PAGERS

A wrist watch-pager is being test marketed in the United States by San Francisco based AT and E Corporation.

To send a message to the pager a caller rings a special number and punches in a message using the buttons on a conventional touch phone. The message is then transmitted by a sub-audible carrier on an FM broadcast station.

The pager alerts the wearer with a beep, and then displays the message on its watch face.

According to AT and E, some 500 000 subscribers can be carried by a sub-carrier. It was negotiating to lease sub-carriers from FM broadcast stations.

Called the Receptor, the wrist watch-pager is being made by Seiko of Japan.

—Adapted from *Westlink*

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WIA 1988 REMEMBRANCE DAY CONTEST OPENING ADDRESS

by

SENATOR THE HON. GARETH EVANS Q.C.

Following is the open address of the 1988 Remembrance Day Contest which was delivered by the Minister for Transport and Communications, Senator The Honourable Gareth Evans Q.C.

I am very pleased to have been given this opportunity to speak to you at the opening of your Remembrance Day Contest.

The Wireless Telegraphy Act was enacted in 1905, and experimentation in the exciting world of wireless was given the government's stamp of approval. No one could have seen the developments to come. The word 'wireless' may have long since been replaced by 'radio', but the skills and enthusiasm of these early experimenters has not in any way been dampened.

Amateur radio as we know it today, is a hobby where data packet transmissions, moonbounce, and satellite communications between amateurs the world over, are everyday activities.

A far cry indeed from the days when spark gap transmitters, and decoherers captured our attention. Since those early days Australian radio amateurs have played an important part in the development of the Australian communications industry as we know it today. I have not the slightest doubt that they will continue to be at the forefront in developing new ways of utilising the radio spectrum.

The Hawke Labour Government has, as one of its major objectives, the promotion and the competitive, innovative and efficient economy, that will see Australia continue to take a place among the major nations of the world in the 21st century.

It is my responsibility as Minister for Transport and Communications to ensure that the communications sector, in all its facets, plays its part in the development of the nation. To foster the necessary climate for such developmental activity my Department has, as one measure, recently introduced revised regulations and licence conditions that remove many of the past limitations governing modes of amateur operations.

The fact that we were able to remove some of the restrictions is in recognition that amateurs generally are using the spectrum in a most responsible manner.

To return to the purpose of your contest today, although specifically the contest commemorates the sacrifices made by 26 Australian amateurs during World War II, it is also an opportunity to reflect more widely on the contributions that thousands of other amateurs have made to the Australian community.

Since becoming the Minister of Transport and Communications, I have become aware of the many occasions on which amateurs have unselfishly established efficient and effective communication networks during times of local and international emergencies. I also know that, throughout Australia, there are many people whose lives have been enriched by being able to participate in this technological and diverse hobby. Our thanks must go to those who are giving their time and skills to the many hours of training involved.

Before closing I would like you to know that Australia's image as a multi-cultural society is promoted by the communication links you are able to establish both locally and world - wide. Finally, I would like to take this opportunity, not only to wish the participants well in the forthcoming contest, but also to wish you well in your experiments for Australia.

REPORT ON OPERATION OF PACKET RADIO BULLETIN BOARDS IN THE AMATEUR RADIO SERVICE

Barry White VK2AAB
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Resolution 87.09.06 from the 1987 WIA Federal Convention recommended that a policy paper be prepared on the operation of bulletin boards. Barry White VK2AAB, offered to co-ordinate the preparation of this paper. A paper entitled* A Report on the Operation of Packet Radio Bulletin Boards in the Amateur Radio Service *from the Australian Amateur Packet Radio Association and dated January 25, 1988, was circulated at the 1988 WIA Federal Convention. Please note that this paper was not a WIA policy paper, but is published in full for the information of all amateurs in view of the considerable interest and concern about packet radio operation.

This paper has been produced by the Australian Amateur Packet Radio Association at the request of the Federal Technical Advisory Committee (FTAC) of the Wireless Institute of Australia and discusses the band planning, and operational requirements of packet radio bulletin board services for the use of radio amateurs in Australia. The effect of these bulletin board services (BBS) on the VHF and HF bands is also considered.

DISCUSSION

The advent of computer oriented communications on the amateur bands, first with RTTY and then AMTOR, led to the introduction of mailboxes for those modes. With the introduction of packet radio, bulletin boards with more facilities than just mailboxes appeared. These extra facilities, such as text file up and down loading, program files, satellite data, etc, placed very much heavier loadings on the frequencies in use than had been experienced by RTTY and AMTOR mailboxes.

The effect of "Networking" will be a major consideration.

CONCLUSIONS

The Australian Amateur Packet Radio Association recommends that only one BBS shall use the main two metre network frequency in each major amateur population centre. Additional BBSs for special applications should use the other frequencies available for packet radio.

Originators of messages for users of BBSs in other Local Area Networks (LAN) should not attempt to lodge their messages directly, but use the message forwarding facilities of the local BBS.

The WIA should consider methods of controlling the numbers of BBSs on network frequencies.

1. INTRODUCTION

Following the discussion on Packet Radio Bulletin Board Systems at the 1987 Federal Convention of the Wireless Institute of Australia (WIA), the Australian Amateur Packet Radio Association was asked to prepare a paper on the operation of these BBS.

2. BACKGROUND INFORMATION

Requests were made to interested groups to comment on the need for a plan to improve the throughput of the packet radio network and on how to organise the operation of the BBS.

Experience in Sydney, where the greatest amount of packet activity is to be found in Australia, has led to complaints by operators about the difficulty experienced in attempting to communicate with stations while BBSs are operating. The great number of collisions occurring when remote stations are involved in downloading files is a major cause of frustration.

3. DISCUSSION

3.1 The Environment of a Packet Bulletin Board

The local network first developed with a small group of stations communicating with each other on a single frequency. In Sydney and Melbourne a Bulletin Board was established to provide a message and file service to the users. While the number of operators remained small, there were no significant problems associated with sharing the frequency with the BBS.

However, during 1986 in Sydney the number of stations using AX-25 grew quite fast and BBSs of the W0RLI type were installed in Sydney, Newcastle and Gosford. With the installation of digipeaters in Newcastle and Sydney, the operators in these centres were now using the BBSs in Sydney, Newcastle and Gosford regularly.

With file downloading from two or three BBSs occurring simultaneously as well as several contacts taking place between stations in the area from Newcastle to Wollongong, the number of re-tries needed by the BBSs increased considerably. It has become apparent that this situation will develop in other centres in the near future and planning is needed to improve the existing situation and provide a model for other centres.

In Sydney and Newcastle, the experimental installation of the level three software NET-ROM in VK2RPH and VK2RPN improved the throughput of the BBSs that use 147.575 MHz. Further improvement is expected when UHF "backbone" frequencies are used for communication between the various repeaters.

3.1.1. The HF BBS

The Region Three Bandplan allocates 14.070 to 14.100 MHz to narrow band modes. However, the HF BBSs have been operating on 14.103, 14.105, 14.107 and 14.111 MHz, all of which are in the phone section of the band as determined by the WIA Bandplan. An examination of the activity between 14.070 and 14.100 MHz shows that there are a great number of RTTY and AMTOR stations operating in that segment. These stations also include a number of mailbox stations. It has felt by the packet BBS operators that there would have been much friction generated if they had operated in that segment, so the packet operation started above 14.100 MHz.

However, this has generated considerable complaint from SSB operators who have run regular nets in that area above 14.100 MHz. These operators complain of the packet stations transmitting when the phone operators have occupied the frequency and they claim prior occupation of the frequency on a long term basis.

A similar situation has arisen in Sydney with the change to 144.800 MHz by the Divisional BBS, VK2AWI.

The problem has been alleviated to some extent by the move of Australian BBSs to 10.147 MHz for much of their local operations.

BBSs are at present in operation in Japan, the Philippines, Hong Kong, New Zealand, Hawaii and the USA, as well as Australia. HF BBSs are presently operating in Brisbane, Sydney, Melbourne, Adelaide and Perth.

There have been discussions between Australian phone net operators and the operators of HF BBSs in the Pacific area but no satisfactory solution has been found. The operators in Region Two were particularly unsympathetic to the complaints of the West Australian phone operators of the Travellers' Net. They did not consider Region Three agreements to be relevant to them.

This problem is not a consideration for the Department of Transport and Communications, but as it concerns bandplanning, it is a concern for the Institute.

3.1.2. The VHF BBS

The facilities of the W0RLI auto-forwarding BBSs with their ability to provide files for programs, newsletters, satellite tracking data, messages to "ALL" items, and the person to person messages has satisfied what was previously an unrealised need.

The time on frequency by BBSs on a weekly evening is an indication of their widespread acceptance by the majority of amateurs. In Sydney, the main frequency of 147.575 MHz has two BBSs operational. The first is the W0RLI/WA7MBL auto-forwarding BBS, VK2XY. The second is the Commodore 64 BBS operated by VK2OP. This letter BBS specialises in providing program services for C64 users. Because of the popularity of the C64 packet radio package which does not use a terminal node controller (TNC), there is a considerable group for whom this BBS is very useful. This is an example of the specialised BBS which can be considered suitable for operation on the main network frequency.

The WIA NSW Division operates a packet BBS, VK2AWI, on 144.850 MHz, to provide news, coming events and a method of sending broadcast items to the Division for the Sunday broadcasts. This BBS automatically changes frequency to the main network frequency of 147.575 MHz, so that messages to and from amateurs in other areas can be received and sent.

3.2 THE EFFECT OF BBS ON THE PRESENT NETWORK

Many files on the BBSs are long files, perhaps up to 32 000 characters long. These take a considerable time to download and occupy a large proportion of the available time. By the correct setting of the parameters of the Terminal Node Controllers, it is always possible to give other users a better opportunity to transmit. This, of course, means that the transfer of the file takes longer.

With a test last year of the NET-ROM software in VK2RPH and VK2RPN, there was a marked reduction in the number of repeats. This allowed more activity between other station to proceed with less holdups. It is expected that further improvement will occur when the UHF "backbone" connections are available.

3.3 AUTO MESSAGE FORWARDING

One of the most useful features of the W0RLI type of BBS is its ability to automatically forward messages to stations who access another BBS in another remote area. Forwarding is operational between Sydney and Newcastle on VHF and to other States including Western Australia, via HF.

This forwarding ideally takes place at times of least activity. At present forwarding to HF and between Sydney and Newcastle occurs in late

afternoon and early morning from 0300 hours EAST. The times are set up by the operator to suit his local conditions and at the appointed times the BBS connects to the required BBS via the network without intervention of the operator. If the remote BBS has messages for the local BBS it will forward them while the connection is available.

In Sydney the BBS VK2AWI which operates on 144.850 MHz automatically changes frequency at a predetermined time to the main network frequency of 147.575 MHz, connects to VK2XY or the Newcastle BBS VK2CZZ and forwards and receives any messages awaiting forwarding.

The format to request a message to be forwarded is shown below:

[S]END VK2AAA @ VK2CZZ

This addressing will indicate to the BBS that this is a message that needs to be forwarded to the Newcastle BBS VK2CZZ.

On HF there is a more difficult situation; as no standard addressing protocol has yet been determined messages are being partially hand sorted by the operators concerned. Discussions are taking place but no "favourite" system has yet emerged.

Messages have been sent and received from Australia to many overseas countries to date including Equador, Britain, New Zealand, Japan, Germany and USA.

The automatic forwarding of messages addressed to "ALL" has resulted in many long news items arriving on local bulletin boards, such as messages from the ARRL to all amateurs. Many of these are of little interest to local amateurs but some are of great interest especially those concerning satellite users.

An addressing system to keep at home those not needing world-wide distribution is urgently needed.

3.4 SPECIAL INTEREST BBSs

There should be provision made for special interest BBSs. Some examples of special interest are, satellite tracking and operational information for groups such as AMSAT Australia. WIA Divisions should perhaps consider their own BBSs such as the operation of VK2AWI in Sydney.

3.5 CHANNEL AVAILABILITY

The subject of bandplanning is fraught with all the traditional "I was here first" problems. At present five two-metre channels, 144.800 to 144.900 MHz are allocated for packet radio digital systems. At present these five frequencies are sufficient for network, simplex and BBS activity. The frequencies 147.575 and 147.600 MHz, which were allocated some time ago, are still in use for the majority of activity. This will continue until UHF connection between Local Area Networks is implemented. At that time it is expected that those areas not having Channel 5A television will move to the lower part of the band.

3.6 PROPOSED BANDPLAN FOR BBS

144.800 MHz Network BBS
144.825 MHz Simplex No BBS
144.850 MHz Divisional BBS, WICEN and third network?
144.875 MHz All other BBS; no restriction on numbers
144.900 MHz Network BBS

However, there is a major problem with this arrangement; where it is desirable to have adjacent Local Area Networks on different frequencies only two are available. In the Newcastle-Sydney-Wollongong area three will be needed (assuming no Channel 5A television).

The reservation of 144.850 MHz for WICEN and Divisional BBSs seems to be impractical. It is suggested that the frequencies of 144.775 and 144.925 MHz be considered for future expansion and not allocated for particular use at this time.

Despite the above, we do not recommend a particular rigid bandplan for BBSs. BBSs other than the main network BBSs should be placed on frequencies decided by local arrangement.

A problem has arisen with the proliferation of BBSs. In the Sydney area there were seven BBSs operating on 147.575 MHz for a period in 1987. At present the number has declined to two 24-hour and two intermittent operations.

3.7 MESSAGE HEADERS

There is much discussion at present on what method should be used for addressing messages. They form into three main camps:

i. The Postcode — in this system, messages would be addressed to an amateur in the following format;

S VK2WI @ 2150

This is the postcode for Parramatta and the message would be forwarded to the BBS that served that (and many other) postcodes.

Advantages:
The Call Book gives the postcode of each amateur, so that it becomes easy to obtain the BBS address of any amateur.

Disadvantages:
Not all countries have postcode systems and there is no country designation in the postcode.
There is no standard format for postcodes.
Someone will have to enter all the postcodes into the forwarding files of the BBSs versus the BBSs that serve them.
There may be more than one BBS in a postcode area.

ii. The STD Code:

The discussion taking place in the USA on the use of the STD and exchange telephone prefixes does not seem to have given much thought to combining the ISD and STD exchange codes.

Advantages:
In all countries numbers only are used so that it would be possible to route a messages to any part of the world.
The numeric address could be found for any amateur via the Call Book and the telephone service if the telephone was connected.

Disadvantages:
A considerable amount of work may still be needed to set up the forwarding files of the BBSs.
If the addressee does not have the telephone connected or has a silent number it would not be possible to obtain the ISDSTDEXC code. It does not solve the multiple BBSs for one code problem.

iii. Call Signs:
Each of us has a unique identifier.

Advantages:
No allocation organisation needed.
Contains country information.
Frequently contains state, province, or district information.

Disadvantages:
Some countries allocate call signs within their boundaries in a random manner. In some countries amateurs may move large distances and not change call signs.
The BBS system or the network will have to build a file of where all users are located and which BBS they use.

3.8 THIRD PARTY TRAFFIC

Recently, the Department of Transport and Communications has made statements regarding third party traffic which appear to suggest that long time practices may not be legal. I refer to the passing of messages from licensed radio amateurs in countries which do not have third party agreements with Australia.

It has been the practice for at least 85 years to pass on messages from another amateur to a third amateur and this has never been considered to be third party traffic, if it meets the rule that it is of a nature that would not usually cause recourse to the public communications systems. In fact, New Zealand has stated that their amateurs may pass on messages to other amateurs overseas even though they have no third party agreements.

The situation is now that New Zealand amateurs may send messages to us but we cannot receive them because we have no third party agreement with New Zealand!

The packet working group of the Radio Society of Great Britain (RSGB) in its report on the packet repeater experiment has reported that the Department of Trade and Industry has agreed that third party traffic will be interpreted to mean traffic originated by, or destined for, non-amateur stations (persons?).

4. CONCLUSIONS

The development of Bulletin Board Services is occurring so fast that most parts of this report has been rewritten several times, but it is clear that the teething problems we are now experiencing are solvable with better technology and better co-operation between packet radio groups and between packet radio operators and other amateur operators.

Particularly in regard to the amateur community generally the WIA will have to play a significant role.

Operations of BBSs has been satisfactory to date given the inexperience of a large percentage of users. More tolerance of others and more consideration in the times at which files are downloaded will pay great dividends.

Frequencies available to packet radio BBSs on VHF are adequate at present and no further requests are envisaged.

5. RECOMMENDATIONS

The Institute should address the means of introducing a gentlemen's agreement on the operation of BBSs. We do not consider that licensing be a reasonable solution as, from time to time, the Sysops will tire of providing the function and pass the burden to another amateur. The Australian Packet Radio Association does not feel that it is in any position to say who should or should not operate a BBS on what frequency. We feel that the best body for this function is the WIA. Even the WIA will run into problems with non-members taking umbrage, but the WIA repeater committee system may provide a model for the required function.

Congestion problems with the existing packet radio system will be considerably reduced when Level Three networking is introduced. How much improvement there will be is difficult to foresee at present.

We recommend that only one BBS operate on the network frequency. An exception to this general principle could be to provide a special purpose BBS such as an AMSAT BBS.

Consideration of the provision of a separate network for BBS forwarding in areas of high traffic density.

Consideration of HF bandplans for bulletin board services is becoming urgent.

The WIA should negotiate with the DOTC with a view to aligning their policy with the long established practices of the definition of third party traffic.

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AN INTRODUCTION TO FOX HUNTING

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This article is an introduction to the art of fox hunting as it is practiced in the south-eastern region of Australia.

The author has hunted these elusive creatures in Melbourne, Mount Gambier, Ballarat and Wagga Wagga. The information presented has been gathered first hand from these expeditions and is therefore based on practical experience as well as a theoretical perspective.

What is a fox and why would anyone want to hunt it? At this point let me assure all those who are beginning to compose letters to the editor about violence and protection of animals, the type of foxes are not those cute little fury ones. No, these foxes are amateur radio transmitters in various shapes and sizes. They range from a normal 100 watt HF transceiver in a vehicle to a tiny two transistor affair buried under a tuft of grass. There are a number of definitions used by different groups of fox hunters, in Melbourne the term *FOX HUNT* is used to define any form of organised transmitter hunt. In Mount Gambier the South East Radio Group (SERG) use *FOX HUNT* when the transmitter is manned and being modulated by the operator and refer to *HIDDEN TRANSMITTER HUNT* when an unmanned transmitter is hidden in some devious spot. The differentiation gives some idea of what is expected of the participants but the techniques are almost the same for both type of events. We will be looking at the details of hunting in various locations later. Throughout this article the term *Fox Hunting* will be used to describe the activity of chasing and locating a transmitter of any sort.

The question of why anyone would want to hunt these foxes is easily answered — it's fun! There are some real thrills in amateur radio such as your first QSO, working a rare country, winning a contest, building something that works, and finding a well hidden fox transmitter. Fox hunting is also a method for allowing adults to play hide and seek without too much ridicule, although spouses have been known to complain on odd occasions! The ability to locate signal sources can be of great value in tracking down a source of interference. The author has used fox hunting techniques to track down powerline interference which was wiping out six-metres and to locate some other forms of interference.

A TYPICAL FOX HUNT

A typical hunt begins by having the teams of hunters, usually called hounds, meeting in their vehicles at a prearranged location. Each vehicle is considered a *team* and all the equipment to be used for the hunt must be in the vehicle. This equipment consists of a directional antenna which can be rotated while mobile and a receiver covering the fox's transmit frequency. Other items such as maps, attenuators, and lights, are not necessities but can prove useful, but more of that later.

A team must consist of at least two people, one to drive the car and the other, called the *beam swinger,* to operate the equipment; we have found that another person to navigate can be of great benefit. It must be stressed the driver must drive and do nothing else, he can listen to what is going on in the vehicle but that old saying of "Keep you eyes on the road" cannot be over emphasised. On more than one occasion we have experienced some very close calls due to the driver looking at equipment and making comments such as "turn the noise blanker off" instead of watching the road.

With the hound teams waiting at the start, the fox (the hidden transmitter and the person are both called the fox) then calls on the hounds to come and find him. The hounds then break ranks forming a loose pack and head off in what they believe to be the direction of the fox.

At conventions the hound vehicles all line up head to tail with much jockeying for position and one-up-man-ship to gain the best position. The call from the fox causes much frantic beam swinging to get the right direction. (Be careful of following another hound for we have found they can be just as confused as you are; and are only going in that particular direction to keep ahead of you!).

The fox's transmissions may be just a carrier with the odd identification, or consist of short bursts of transmission usually becoming less frequent as you get nearer. Often the fox will give helpful hints such as "I can see clouds" or "there are cars near by". While the fox is transmitting the beam swinger rotates the antenna and determines the signal direction. Using the directions from the beam swinger and information off maps, the fox is tracked down to a small area. This is where the hounds need to use their eyes and brains as well as their radio equipment. The author has bad memories of driving past the fox's white four wheel drive vehicle several times without seeing it! Once you are close to the fox it may be necessary to get out of the vehicle and hunt on foot. That's when a 'sniffer' comes into play. A sniffer is a small portable outfit which has a directional antenna and some form of signal detector. This detector is usually much less sensitive than a complete receiver as it is only used when you are close to the fox. An article on a two metre sniffer is planned to be published in a later edition of *Amateur Radio.*

Finding the fox may not be easy, it could be buried, hidden in a hollow road side post or telephone book, Father Christmas may have it in his toy sack, or it may be inside the fake rock in the middle of the stream; all these hiding spots have been encountered over the years. Eventually you will locate the transmitter and there will be some way of informing the fox personnel that you have found it, you are then *IN,* a fox hunters term for being recorded as locating the fox. So that is how a fox is caught.

There are various scoring systems in use depending on the competition. At conventions there is usually just first, second and third, whereas the regular Melbourne hunts have a points system tied to the time of arrival.

Most fox hunts are conducted on two metres with occasional hunts on other bands, usually 80 metres, 10 metres and 70 centimetres. Two metres is used for a number of reasons with the main ones being the availability of equipment and the relative small size of antenna required.

BASIC TWO METRE EQUIPMENT

For two metre hunting the basic equipment required is a receiver and an antenna. The receiver can be almost any type but it should have an S-meter, capable of covering the whole two metre band, and be multimode although this is not essential. Most convention two metre hunts use FM and operate above 146 MHz. On the other hand the Melbourne group use AM around 144.250 MHz.

The mode used does not make too much difference as most foxes don't give valuable information over the air, thus if you are listening to an FM fox on an AM receiver you won't miss any useful information. It has been found that swapping receive modes can be helpful, especially if the signal is weak SSB or CW modes provide an edge over FM or AM.

In Melbourne the IC-202 has been a popular choice as it covers the frequency of interest and the receiver gain can be controlled by a pot in the PTT line, see Reference 1. Another popular choice is a converter into an HF receiver. With the modern general coverage transceivers this will give all modes and complete band coverage. A suitable converter can be found in Reference 2. If using a converter with a general coverage receiver it is advisable to use a 118 MHz crystal to give complete coverage of the two metre band.

The antenna is a most important part of the equipment, if it gives ambiguous directions it can lead a hound, that is **YOU,** in a totally false direction. Thus an antenna should give an unambiguous indication of direction and be small enough to be easily rotated at highway speeds. The peaks or nulls of an antenna can be used for determining the direction to the transmitter, a peak will give the best results especially when the signal is weak. On two metres a peak is easily achieved with a Yagi or Quad antenna. The three element Yagi described separately is a good all round antenna. It does not provide the maximum gain that can be achieved but has a clean pattern with a good front to back ratio.

When driving along a road the antenna should be rotatable from inside the vehicle. There are a number of methods of achieving this, ranging from having a broom stick resting on the floor or arm rest, through to a complicated series of gear boxes and support bearings with the antenna centred on the roof of the vehicle. Most hounds use a piece of pipe attached to a roof bar as a bearing; see photograph. This gives an indication of one simple method of supporting the antenna.

It is possible to make the vertical support from wood or metal however, most use wood as this allows the antenna to be mounted vertically and will break if it comes in contact with overhanging obstacles such as trees. Teams may have a preference for one polarisation but most usually adhere to what the fox is using.

Many hounds use an attenuator to reduce the signal strength into the receiver as they approach the fox. A variety of attenuators have been described in amateur radio literature over the years. The one described in the *ARRL Handbook* would be quite suitable. While an attenuator is a handy addition to the hounds equipment it is not mandatory, as there are a number of ways of determining a bearing when you get closer to the fox. The simplest method is to tune off the frequency a little and hunt on the skirts of the signal. Don't forget to tune back for the next hunt or you may wonder why everyone else but you can hear the fox.

Just where the beam swinger should sit is a matter of team preference — some navigators like to sit in the front and observe the passing landscape, while some beam swingers suffer from motion sickness and prefer to sit in the front. The beam swinger of our team usually sits in the front because all the equipment won't fit in the back. Also, there is often two navigators who can argue in the back with minimum disruption to the driver!

That covers the equipment and methodology. Any readers requiring assistance in running hunts for a local club or in becoming a fox hunter

please contact the author with a SASE. Further articles on sniffer building and HF hunting are planned. There is only one way to find out if you will enjoy the thrill of chasing transmitters around and that is to get out there and try it. Next time you are planning to attend a convention, pack some fox hunt gear and have a go. Most hounds will offer advice and encouragement to new teams as they will help to improve the level of competition and keep the sport alive.

WHERE TO TEST YOUR SKILLS AND THE RULES THAT APPLY

WIA Victorian Division Melbourne two metre group

This group hold hunts on the second Friday of the month, including January. Frequency is 144.250 MHz AM, with a liaison frequency of 145.675 MHz FM. Five hunts are usually held during the evening commencing at 8:00 pm in the car park adjacent to the roundabout at the corner of Swanston Street and Cemetery Road, in Parkville. Scoring is zero points for the first to find the fox then one point per minute for coming after the first hound, after 10 minutes, 'time' is up and the meeting point is announced over the fox and on the liaison frequency. The lowest total score for the night wins and runs the hunt next month. At the end of the evening a supper is provided at a modest cost. There are no limits on equipment except it must be in a single vehicle and outside assistance, such as bearings from other stations, is not permitted. New teams are always welcome. For further information, contact the author on (03) 435 7870 (AH) or Geoff VK3CGH on (03) 288 6019 (AH).

South East Radio Group (SERG) Mount Gambier Convention

Is conducted on the Queen's Birthday weekend (June). This convention has hunts on two metres (146.450, 146.500 and 146.550 MHz), 70 centimetres (439 MHz), 80 (3.580 MHz) and 10 metres (28.450 MHz). A two metre sniffer hunt is also included. Only one set of equipment per car is allowed and they provide a ticket which has to be obtained at the start and given to the fox when you find him. Prizes are awarded for first and second with points for the overall trophy for up to third place. The convention also has a large flea market, good food, a home brew competition and scrambles on a number of bands. Contact the SERG Inc (VK5SR) at PO Box 1103 Mount Gambier SA 5290 for further information.

Wagga Wagga Amateur Radio Club Convention

This is convention conducted during October each year which has a number of two metre hunts with multiple transmitters on the same frequency — find one, turn it off, then look for the next one and so on. Prizes are awarded for places which are determined from a number pegged to the transmitter. When we last visited this convention there was a interesting display of working vintage engines and farm equipment along with a flea market and displays. Contact the Wagga Wagga Amateur Radio Club (VK2WG) at PO Box 294 Wagga Wagga NSW 2650.

Ballarat Amateur Radio Group Convention

Held on the Sunday before the first Tuesday in November, this convention has fox hunts on two metres, 70 centimetres, 80 and 10 metres with similar rules and scoring as the SERG convention. This is another chance to pick up some pre-loved gear and put a face to the voices you know so well. Contact the Ballarat Amateur Radio Group (VK3BML) at PO Box 216E Ballarat East Vic 3350.

North East Radio Group (NERG) Inc Quarterly Fox Hunts

The NERG run these as a family fun event and hold hunts on two, 80 and 10 metres once a quarter on a Sunday afternoon. The meeting point is the north-west corner of the car park at Doncaster Shopping Town, at 1:00 pm. The action ends at one of the many barbeque venues in the area for a BYO tea and chat. The dates for these hunts are advertised on the Victorian Division broadcasts through VK3BWI. Contact the NERG at PO Box 270 Greensborough Vic 3088, or contact the author.

Victorian Fox Hunt Championships

Held in February each year with hunts on 80, 10 and two metres as well as 70 centimetres and 2 metre sniffer hunts. Prizes are awarded for each event and an overall trophy for the best team. This event will be co-ordinated by Richard Hinsley VK3CRH/VK7CG in 1989 and he can be contacted through PO Box 270 Greensborough Vic 3088 or once again contact the author.

REFERENCES

1. *MANUAL GAIN CONTROL FOR THE IC202* — GIL SONES VK3AUI, *AMATEUR RADIO* MARCH 1979 P11.
2. *A TWO METRE RECEIVING CONVERTER* — HAROLD HEPBURN VK3AFQ, *AMATEUR RADIO* OCTOBER 1984 P12.

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DID YOU RECEIVE YOUR AR FOR AUGUST?

It is believed that some copies of August *Amateur Radio* became separated from their plastic envelopes in the post.

If you did not receive August AR please advise the Federal Office in writing (PO Box 300, Caulfield South, Vic. 3162) of your name, call sign and address.

The mailing house will arrange for a replacement magazine to be forwarded to you as soon as practicable.

JAMBOREE ON THE AIR (JOTA)

Bob Demkiw VK2ENU
18 Ettalong Place, Woodbine, NSW. 2560

Although throughout the year there are many activities which contribute to the public awareness of amateur radio, there is perhaps one event which has a better potential for attracting new members to our hobby. This event is the annual Jamboree on the Air (JOTA) which exposes amateur radio to our future adults.

JOTA is an important activity in that it allows boys and girls to have first hand experience in the operation of radio communications. It provides them with an insight into one of the aspects of every day life, which can be expanded through experience in the use or knowledge of the various components of the hobby that operators are willing to demonstrate to the Scouts and Guides. All are familiar with radio, television, video recorders and computers which are common in most homes and schools. It is commonly accepted that these items are used to convey information, whether it be music, pictures, news, stories or other data, but beyond this little is known or understood how communications are achieved. JOTA is an opportunity of expanding the concept, especially when the ages of the young people are taken into consideration.

The Jamboree on the Air is as the name implies — a large gathering of both Scouts and Girl Guides on the air.

It gives the youngsters an opportunity to make contact with other members of the movement, to exchange ideas and to develop friendship while at the same time educating and preparing them for adulthood. Both organisations have survived many upheavals, sweeping social events and challenges from rival youth movements because they put the needs of young people first. "Since its inception, Scouting has been dedicated to the ideal that young people will make better citizens and be happier individuals if their natural enthusiasm and desire for structured activity are allied to a sense of purpose and achievement . . . As well as teaching practical skills, group dynamics, self-realisation and expanded perceptions of the world . . . The methods and activities of Scouting must satisfy each succeeding generation of children and now offer a wealth of up-to-date challenges such as electronics and air activities." (Introducing Scouting: 1986:11).

Similarly, the aim of the Girl Guide Association "is to provide a program embracing a wide range of leisure time activities and interests which, while enjoyable in themselves, have an underlying educational purpose, namely to develop individual character based on the values expressed in the Promise and the Law as laid down by the Founder, Lord Baden-Powel, and to foster a love of country and to promote a full sense of citizenship and to encourage international goodwill." (Girl Guides Association: 1986:3).

Lord Baden-Powel of Gilwell, founded Scouting for boys in 1908 and the Girl Guides movement was founded in 1910. Today Scouts and Guides can be found in over 150 countries and territories. The movement has a membership in excess of 16 million.

GETTING STARTED

As most people are naturally shy, it is often difficult to "get the ball rolling". The main difficulty is that not all amateur radio operators are aware of JOTA and likewise, not all Scout and Guide Leaders are aware of amateur radio. Therefore, the first approach should be made to the State headquarters of the respective organisations; ie the Girl Guide Association or the Scouting Association. On establishing contact you will be asked to make further inquiries with the JOTA co-ordinator who may be an amateur operator or a leader who knows something about the activity.

At local level, the District Commissioner, or Group Leader may be approached about running a station at pack, group or district level. The levels will give you some idea of the numbers involved; eg a pack usually has 24 cubs or brownies, a group may have a cub pack and a scout troup (48) while a district may comprise two or three groups; ie approximately 100 youth members. The level of participation can be selected to suit the operator.

DURATION

The duration of a JOTA station can be varied to suit the operator/s. It can be conducted for any period of time during the Jamboree whether it be one hour or 24, it is totally up to the operator. However, the overall time will depend on the numbers that the station will be catering for, the type of programs to be run and the location of the station. The programs will vary with the type of youth members involved. For instances, if it is a cub or brownie pack then the activities can be of a simple nature as the ages will range between say seven years and 11 years, while in the case of scouts and guides the program will require some variation to suit the needs of youth members in the ranges of say 11 and 18 years.

PROGRAM

The types of programs to be conducted during a Jamboree are dependent on the resources of the operators, leaders and the physical location of the JOTA station. If it is to be conducted at the operator's home, then only a small group of youth members can be catered for and the program may simply consist of a tour of the shack and perhaps a demonstration of operations.

Other programs may consist of stations being set up in Guide or Scout Halls while still others maybe a camping site under canvas. Similarly, if you are willing and only have two metres FM and a whip on the car, but you are willing to set up shop in a hall, then that is all you can use. On the other hand, groups of one or two, or clubs might run a whole variety of equipment including HF, RTTY, Packet, Slow Scan Television, etc/ No matter what resources are available to you, the main thing is that you have done your best to allow some youth members to participate in the event. For example, I have set up shop on a number of occasions with the intention of using both VHF and HF only to find that propagation on HF is so poor that only VHF could be used and only after waiting several hours for a turn on one of the repeaters. Still we have had fun and that is all that counts.

Perhaps the most difficult part of the whole exercise is finding ways in which to explain what amateur radio is about, why people have it as a hobby, what QSL cards are and why they are collected. Its like asking youth members why they collect an infinite number of objects when testing them for their collection badges and receiving an infinite number of answers back, we all have our own reasons. It is however, helpful to put together some static displays of material which can provide some insight, whether it be copies of *Amateur Radio,* QSL cards or components. Again there is an endless variety of material which can be used to help your explanation and for the youth members to understand a little more than they know beforehand.

Leaders should be able to develop a program of activities to keep those youth members not occupied with talking on the radio/s or awaiting their turn with either games or set tasks. These activities could include:

Making walkie-talkies from milk cartons
Making Morse keys with wire, batteries and torch batteries
Making telephones with tin cans and string
Making crystal radios
Running a guessing game — naming electronic components
Running lessons or testing for interest badges

RADIO PROCEDURES

Although you as an operator may not have second thoughts about picking up a microphone and talking to someone at the other end, some consideration must be given to the youth members who may not have done it before. Many will be shy, hesitant, some will not try and all will be lost for words. Of those who will want to have a turn many will think it is either like that seen on television where both parties are almost seen at once or like the telephone where a button does not need to be pushed and the other party will reply at once, and that it will all clear and audible. Many will hang there and try to collect their thoughts while the other party will try to work out what is causing the hold-up. Then you may strike the youth member who knows it all because they have a Citizen's Band radio and think that the whole show is exactly the same. One other problem that could be encountered is the case of the 14 or 15 year old Guide who is chatting up the 18 year old Venturer, or vice versa.

It is considered a good idea to meet with the youth members prior to the Jamboree and give a talk on amateur radio and demonstrate procedures. Alternatively, arrangements could be made with the leaders to coach the members on some of the things which could be said and the procedures. Examples could include:

1. My name is . . . . . and I am from the . . . . . Guide/Scouts. My age is . . . What is your name and what is the name of your group?
2. Where are you located . . . . . ? What are your hobbies/what interest badges do you have?

I consider it important to state that operators are responsible for their equipment and therefore

the only item that youth members should be taught to operate is the microphone. The operator should be in attendance at all times to supervise the proceedings and carry out station identification.

On a similar note it should be noted that the possession and consumption of alcohol at Scouting/Guiding activities is totally prohibited.

SPECIAL CALL SIGNS

Applications for the issue of special call signs are to be directed to the Department of Transport and Communications, either through the Group Leader in the case of Scouts and the relevant District Commissioner in the case of the Girl Guides.

DOTC has a block of call signs in which the first letter of the suffix denotes the type of organisation involved; ie the letter "S" stands for Scouts and the letter "G" stands for Girl Guides. Whichever organisation is making the application it will need to nominate a custodian for the licence, I understand that this person should hold a full call. DOTC charges the annual licence fee applicable for the call. Further information about obtaining a special call should be sought from the Department in your State.

CONCLUSION

In conclusion, I hope that the information supplied is of some benefit to those who have either participated in previous Jamborees or those who maybe contemplating in offering their services to either of the organisations involved. I have participated in a number of these activities and although I have enjoyed the challenges, I have wondered how the other groups have coped with the situations.

References:

1. Introducing Scouting, 1986. The Scout Association of Australia, 3rd Edition.
2. Helpful Hints for Local Associations and Commissioners, 1986. Girl Guides Association (New South Wales).

RFI = NUISANCE? A Look at Legalities

The Ravenscroft court case in Canada has sent shock waves through national radio societies and radio amateurs throughout the world.

Jack Ravenscroft VE3SR, was found guilty of being a "nuisance" when his amateur operation interfered with a neighbour's domestic appliance operation.

The radio frequency interference (RFI) problem was not attributed to Jack's equipment, but due to the susceptibility of electronic and electrical consumer equipment to interference from amateur radio signals.

He was found guilty of being a nuisance and put off the air.

Jack lodged an appeal in the Court of Appeals, which ruled that both Canadian radio amateurs and those affected by RFI must work together to remove the problem.

This means that Canadian radio amateurs must arrange for neighbourhood radio frequency interference suppression to a standard approved by the Canadian Department of Communications. Those affected by RFI must accept the modifications, and if they do not, then they have no further recourse.

But, whilst that court ruling only applies in Canada, it raises questions which could have application in Australia. *Amateur Radio* magazine sought a legal opinion on the case from George Brzostowski VK1GB, WIA Federal Executive member, and Lawyer. The following reviews the Canadian landmark RFI ruling:

RADIO INTERFERENCE AND THE LAW OF NUISANCE

I have been asked to explain the ramifications of the Canadian Appeal Decision in the Ravenscroft case for the Australian radio amateur. What follows is intended to be for information only. The variety of circumstances in which nuisance may be held to happen is so vast, that I do not assume responsibility to write something which has universal application.

WHAT IS "NUISANCE"?

An accepted definition of nuisance is: "An **unreasonable** and **substantial interference** with the **use and enjoyment of property**".

The key words are in **bold.** Clearly, RFI may constitute interference with the enjoyment of television, videos, stereo units, etc. Whether nuisance has been committed depends on whether the extent of interference is unreasonable and substantial.

WHAT IF I DO ALL I CAN TO AVOID RFI?

If you have, then you may prove that you are a responsible and considerate citizen, but you may still be guilty of nuisance. A good way of looking at it is to draw analogy with the growing of a tree. That is something which normally is quite inoffensive, but once its roots start to cause damage to a house on the neighbour's land, a nuisance has been committed by the person on whose land the tree grows, regardless of what steps were taken to confine its root system, and regardless of who planted it.

Nuisance is a strict liability tort (ie a wrong done to someone else).

Using a transmitter under terms of a licence, is perfectly legal in itself. However it is the interference with the neighbour's use of his equipment which must be found to be unreasonable and substantial, not the actual use of the transmitter.

However, while the reasonableness in the use of a transmitter is not directly relevant in itself, the conduct of the person causing the RFI may have an indirect bearing on the question of whether the interference was "substantial and unreasonable".

For instance, somebody transmitting only on Saturday afternoons on the 14.220 net for a few minutes, is unlikely to be found guilty of RFI interference. Someone talking every evening for a few hours, during prime viewing time, is exposed to the risk of a different finding.

The law is not perfect, and I even venture to say that a few minutes each week of splatter and unsuppressed harmonics may be found not to constitute nuisance, (on the ground it is not substantial enough to have become "unreasonable") but several hours each day of perfectly clean signals, may be a nuisance!

WHAT IS MEANT BY "UNREASONABLE AND SUBSTANTIAL"?

A related question is, "What about the quality of the susceptible equipment"?

The judgment in the Ravenscroft appeal is not much help in making this issue clearer. What it does do, is look at the practicalities of how can a neighbourhood dispute be resolved. As you may know, Jack Ravenscroft lost at the first instance, and was not only ordered to pay damages to the neighbour, but he was also prevented by injunction from using his equipment.

The Appeal Court ordered Jack to compensate the neighbour for inconvenience, but lifted the injunction conditionally, and ordered the neighbour to co-operate, and make his equipment available for modification which should prevent further susceptibility to RFI. If the neighbour failed to co-operate, the injunction was lifted permanently. If the modifications failed to eliminate the problem, then the injunction was to be reinstated.

It emphasised the need for reasonable give-and-take in a suburban dispute.

The case is interesting for two other reasons. It paid little heed to the question of whether the neighbour's equipment was unusually sensitive to RFI, but such sensitivity may have been the subject of argument in the lower court, and simply omitted from the text of the appeal judgment.

The issue of unusual sensitivity may be important in deciding whether the interference was unreasonable in the first place. There is no suggestion that the neighbour's equipment was defective, but there is a strong suggestion that it had scope for further improvement.

Therefore, if Jack wanted to use his radio, and if the neighbour had reasonable equipment in the first place, it was up to Jack to arrange for that equipment to be made compatible with his transmissions.

I am of the view that where the neighbour's equipment is defective, ie as falling below reasonably accepted standards, a radio amateur would have a strong argument that he is not guilty of nuisance on the ground that the interference was not unreasonable in the first place. The argument could be that the neighbour brought it upon himself, and that in such cases, there ought not to be any obligation to improve the neighbour's equipment.

What is comforting, is the affirmation of the need for reasonableness on the part of the neighbour.

RF IMPEDANCE MATCHING USING FERRITE TOROIDAL CORES

Part 2: Auto-Transformers.

Stephen Bushell VK3HK
74 King Parade, Knoxfield, Vic. 3180

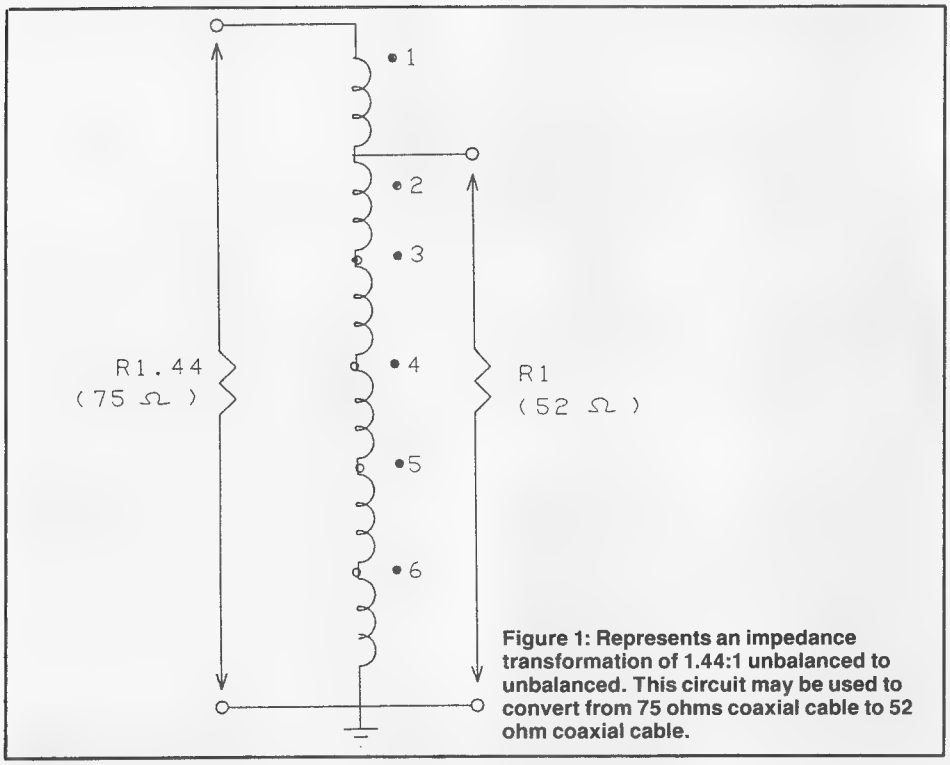

Figure 1: Represents an impedance transformation of 1.44:1 unbalanced to unbalanced. This circuit may be used to convert from 75 ohms coaxial cable to 52 ohm coaxial cable.

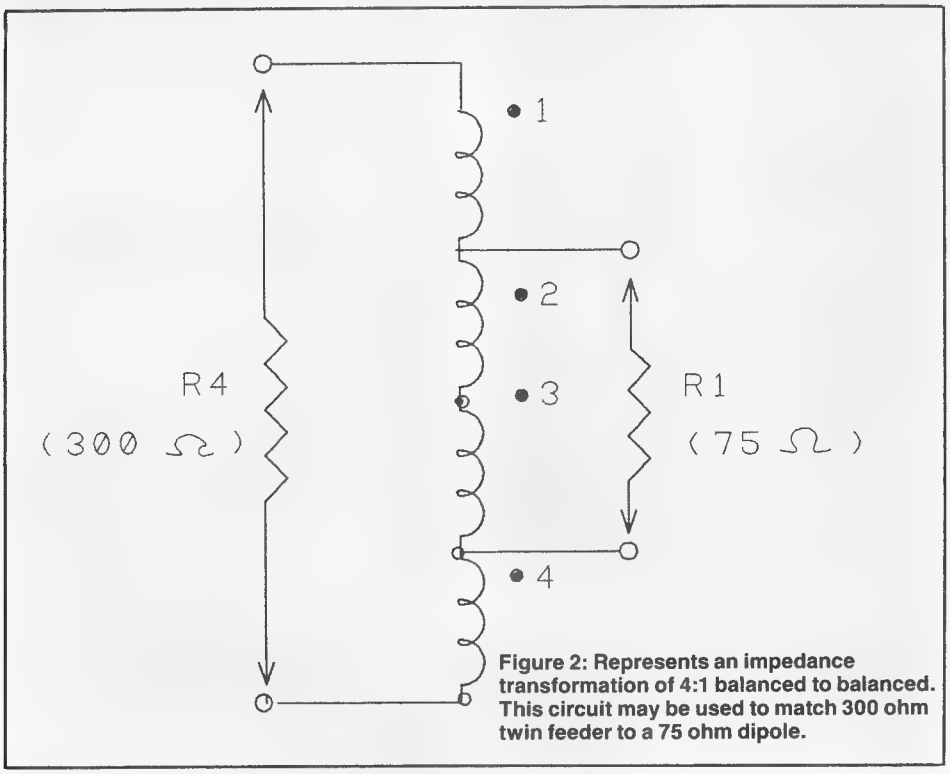

Figure 2: Represents an impedance transformation of 4:1 balanced to balanced. This circuit may be used to match 300 ohm twin feeder to a 75 ohm dipole.

In Part 1 we dealt with transmission line transformers. We used transformation ratios which were related to a whole number greater than one squared. We were able to achieve ratios 4:1, 9:1 and 16:1 in balanced to unbalanced and unbalanced to unbalanced current formats. However, ratios and balances different from these are often required for more general application.

The auto-transformer differs from the transmission line transformer in that the transformation ratio and current balance depends on the number of windings and the particular placement of tappings along them. This arrangement is convenient in that the taps may be placed at the junction of the windings which are readily accessible when wound onto a toroidal core. (See Figure 1).

Determination of the number of windings and the tap positions is easy especially if you have either a calculator to provide square roots or a slide rule. I find the slide rule is easier to use in that only one operation is required to provide the number of windings and the tap position, whereas the calculator method can be rather tedious.

Now is the time to try to find your old slide rule which you thought you would never use again. (Note — the batteries will not be flat!).

PROBLEM: To convert 75 ohm coaxial cable (unbalanced to 52 ohm coaxial cable (unbalanced).

SLIDE RULE METHOD:
Align 75 on the A scale with 52 on the B scale.
Scan the C and D scales for integers which are aligned.
5 on the C scale is aligned with 6 on the D scale.

SOLUTION: We require a Hexifilar (6) winding which is tapped at the junction of windings 5 and 6. See Figure 1.

CALCULATOR METHOD:
52:75
= 52 ÷ 75
= .693
.693
= .83

The tedious part is in converting the decimal back to a fraction to obtain the solution which is 5/6.

UNBALANCED TO UNBALANCED

It should be noted that the problem just dealt

with entailed an unbalanced to unbalanced format. The windings (Figure 1) share a common grounded point at the bottom of the transformer and have an uneven turns ratio, 5:6. Consequently, current is unbalanced with respect to each winding and to ground.

BALANCED TO BALANCED

To achieve this arrangement we must have a winding configuration wherein each impedance looks into a separate but equal number of windings which, as we are dealing with an autotransformer, will all be in series.

At this point, operation on the calculator really becomes a bore so, if you haven't found your slide rule, you should try a little harder to remember where you last saw it.

What we have to achieve is a winding/tapping ratio which is separated by an even number. If we want to match 300 ohm balanced to 75 ohm balanced we see from the C and D scales after aligning the 300 and 75 with the A,B scales that the smallest ratio separated by an even number is 2:4 — we therefore require a quadrifilar (4) winding tapped one winding either side of centre. (See Figure 2).

Unfortunately, life was not meant to be easy!

All ratios do not provide a tapping point at the junction of windings and one must decide if an imbalance (VSWR) is acceptable or if a tapping should be placed part way along a winding. In the case of the 300 ohm feedline and the split dipole driven element of Figure 1, Part 1, where the impedance at the element centre was measured at 35 ohms, we find upon aligning A and B scales, 300/35 that the closest aligned evenly spaced integers are 2/6. They are not, however, exactly aligned. Bringing the C and D scales (2/6) into alignment causes the B scale (33.3) to move into alignment with 300 on the A scale. A resultant shift from 35 to 33.3 which gives a ratio 35:33.3 or 1.05:1 which is in fact the VSWR resulting from the impedance change. This is of no consequence as it represents a virtually imperceptible loss.

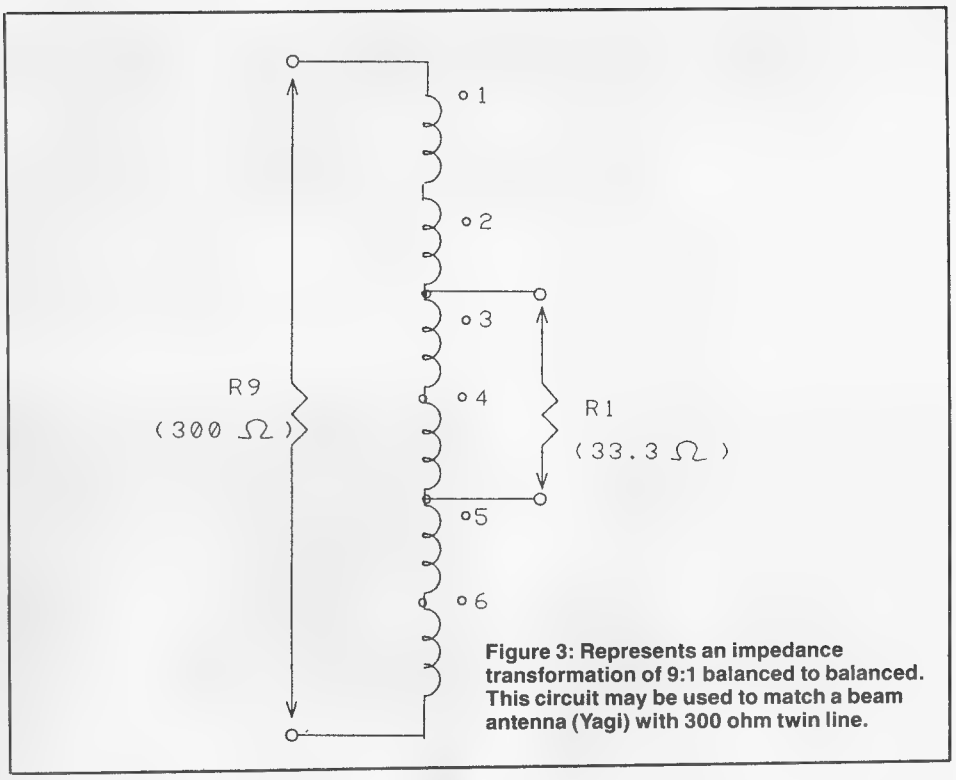

Figure 3: Represents an impedance transformation of 9:1 balanced to balanced. This circuit may be used to match a beam antenna (Yagi) with 300 ohm twin line.

To match the beam to the 300 ohm twin feeder therefore will require a hexifilar (6) winding transformer tapped one turn wither side of centre. (See Figure 3).

Net time we will look at conventional transformers and see how they compliment and expand the variety of impedance transformations and current balance formats dealt with so far.

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VK6 MORSE WORKSHOP A BIG HIT . . . AGAIN!

Andrew Baumanis VK6WB
35 Ormaston Road, Carine, WA. 6020

Following the success of two Morse Workshops in 1987, it was decided to have another this year.

The aim of the program is to build confidence in both sending and receiving at Amateur Operator's Certificates of Proficiency (AOCP) examinations with practical experience in an environment similar to the examination itself. The VK6 Practice Morse Co-ordinator, Malcolm Johnson VK6LC, spent many weeks compiling a program and, following on from last year's successes, he excelled in producing a thoroughly interesting and enjoyable Saturday morning.

In all, 42 operators and hopefuls attended the session, consisting of 24 candidates and 28 staff. Of the candidates there was a keen interest shown by non-licensed persons — 17 of these attended, leaving one N-call, three K and J calls and three Z calls. Three of the staff who came to help were present at the 1987 Workshops as candidates without call signs.

The new Western Australian Divisional President, Christine Bastin VK6ZLZ, opened the morning's activities, and was immediately followed by Glen Ogg VK6KY, a DOTC Examiner, who spent 10 minutes discussing DOTC Receiving Examination requirements, and what was expected of candidates. He placed strong emphasis on the role of the examiner, not to fail candidates, but to give them the best opportunity to demonstrate their competence. Following this, it was straight into five and 10 words per minute practice. This was done under examination conditions, but without the pressure of an examination. Ample time was available at the end of each practice for discussion.

Malcolm VK6LC transmitting practice text.

All heads down under examination conditions.

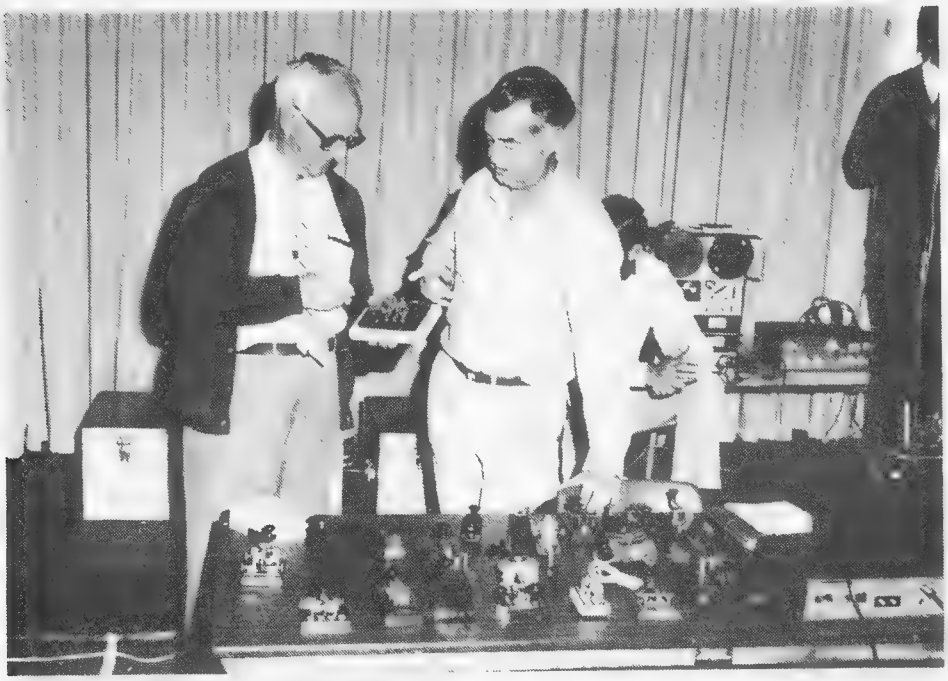
Barrie VK6AF, DOTC Examiner, demonstrating correct key manipulation.

Barrie Butler VK6AF, a DOTC Examiner, with 45 years experience in telegraphy, followed with a talk and practical demonstration on code sending and examination requirements, including key manipulation, correct characterisation and spacing, correct erasing and, most importantly, how to face the examine. It was good to see the DOTC examiners prepared to come and give help and advice to candidates. It was thoroughly appreciated, especially meeting the examiners in a casual atmosphere. Barrie took time to demonstrate correct and comfortable ways to handle a key. He also explained that, as long as the CW was good, he was quite happy to accept sending using any part of the anatomy, eg nose or little toe.

The morning included other items of interest. Details about WIA membership and activities were presented by Peter Hackett VK6PK, the VK6 WIA Membership Secretary. Christine and Cliff Bastin VK6ZLZ and VK6LZ, detailed WIA education, book and Morse tape facilities. Dave Couch VK6WT, presented an enthralling Morse

Above:
Practice Morse Operators, Alan VK6AR and Doug VK6AUL, check the sending technique of Larry VK6ZLW.

Below:
Dave VK6WT and Tom VK6TO, looking at some historical Morse keys.



code key demonstration showing a large variety of keys, old and new, and all shapes and sizes. Some of these were old military keys, some were used while strapped to one's leg, whilst another clipped onto the steering wheel of a car!

The session concluded with receiving stations being set up. Candidates were able to practice sending in an examination environment and receive helpful comments after the practice texts were sent.

The three hour morning passed quickly and went into "overtime" as nobody was interested in leaving. However, the effort put in by Malcolm VK6LC, in preparing the morning's program, the VK6 Morse operators for their time and patience, DOTC examiners, Pam, Malcolm's wife, who ensured that no one was thirsty or hungry, and all other staff, was greatly appreciated by those who attended. These workshops have now been a great success for the past two years and look set to be a regular feature on the VK6 Calendar.

ar

MORE ASTRO-AMATEURS?

The ARRL and AMSAT have made a joint proposal to NASA on amateur radio participation in the US space station to be built in the 1990s.

The submission points out that the hobby could help promote favourable public awareness of the space station and the US space program.

The ARRL and AMSAT envisage experiments using voice, data and video communications techniques, providing a means of recreation for crew members and, as a back-up means of communications.

The proposal highlights the ability, through amateur radio, the space station would have of holding two-way communications in real time with selected school classrooms and civic gatherings, with ground facilities manned by local volunteer radio amateurs.

The ARRL and AMSAT emphasised that a key element to the proposal's success will be the planned AMSAT Phase 4 Geostationary Satellite due for launch in 1992, with tremendous digital data capabilities.

—From the *ARRL Newsletter* and *Gateway*

ABBREVIATED CALL SIGNS

The use of abbreviated call signs, such as dropping the VK prefix and using only the call sign suffix is not permitted.

The WIA Victorian Division sought clarification on abbreviated call signs after a radio amateur queried their use on a repeater, and requested the WIA seek a definitive answer why they could not be used.

The Department of Transport and Communications (DOTC) said: "The use of abbreviated call signs is not approved because they are often call signs in their own right and their use could lead to confusion."

If you use only part of an amateur station call sign it could in fact be the entire call sign of another station in another radio service.

ar

PLASTICS BREAKTHROUGH

A class of plastic when doped with certain impurities has been found to conduct electricity efficiently, and in some cases, equal or better than copper.

One prospect of this development will be rechargeable batteries with double or triple the capacity of current batteries.

A full report entitled *Plastics that conduct electricity* was published in the February edition of *Scientific American* magazine.

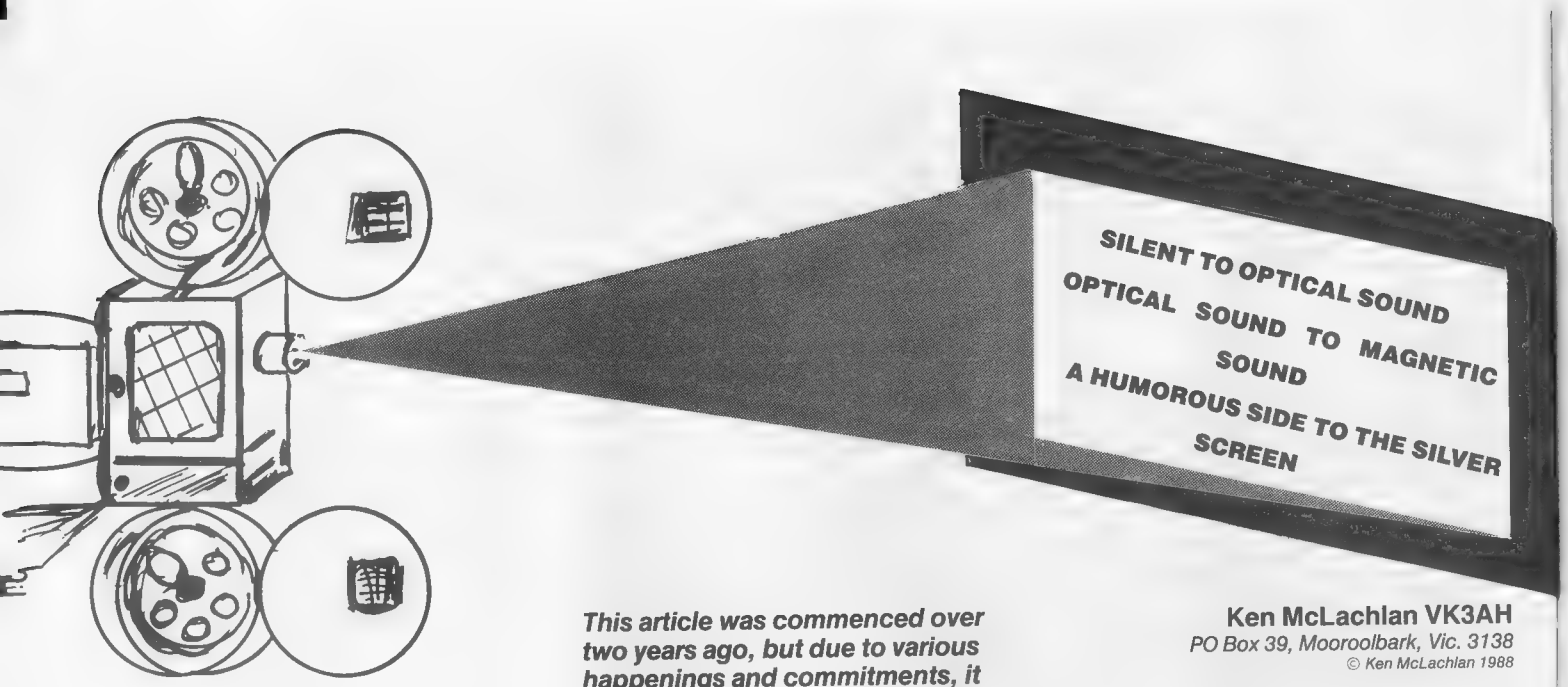
—Adapted from *Westlink*

ar

HAMADS

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.*** Please remember your STD code with telephone numbers

DEADLINE FOR NOVEMBER IS SEPTEMBER 16, 1988



Ken McLachlan VK3AH
PO Box 39, Mooroolbark, Vic. 3138
© Ken McLachlan 1988

This article was commenced over two years ago, but due to various happenings and commitments, it was pigeon holed and collected dust. Alas, it has been resurrected and is dedicated to the many amateurs who were and are still engaged in the commercial theatre industry.

I personally have been officially involved with the industry since 1948, being privileged to enjoy every facet of screening to the magical silver screen in most States of Australia either, as a projectionist or service engineer. In Victoria, the writer has held positions from spool boy to circuit manager of a theatre group. Many times these positions were moonlighting to my main profession.

Many amateurs, have been commercial projectionists over the years, some now are unfortunately Silent Keys and it is sad that they cannot reminisce the earlier 'silent' days and the latter days of 'the talkies' or the 'flicks', depending in which area you were at the time. It was a different sort of occupation, as no one in the industry ever enjoyed a normal social life, because they were providing entertainment to, in those days, the multitudes. Many WIA members will read this and it is trusted it will bring back many happy memories.

It was not realised, until the research and note making stage for the creation of this article, of how much 'water had gone under the bridge' in four decades and the progress the industry had made in those years. Front shutter, open geared and even converted hand-cranked mechanisms that would never have got past any Inspector, whose duty it was to uphold Legislation and numerous other oddities that have occurred since the inception of the movies would fill a book, not just an article in *Amateur Radio*. Such marvellous innovations as 3D, Cinerama and other inventions that dramatically increased the sales of remedies for analgesia, to the operator or service personnel have been neglected.

Unfortunately regulations were different throughout the Commonwealth, as in the State of Victoria, the legislation covering Public Buildings and places of entertainment was controlled by the Department of Health and even to be in a 'Biograph Operating Room', one had to licensed as a Trainee or be a fully qualified Projectionist, obtained by examination which encompassed Regulations, DC Theory, AC Theory, Sound, Optics and a frightening practical examination (where some examiners were quite practical jokers), where you had to present a part performance. This was all after a three year, then later two year apprenticeship and one had reached the magical age of twenty one years (this also has been dropped to a lower age), attendance at a recognised course and be a responsible person of sound character. As this was a second job, the school was out, but as soon as practicable during my training, the thought of being the Manager/Projectionist of 'my own theatre' at the tender age of 18 lured me to become a member of the defense forces, joining after initial training, an entertainments unit. An experience, which trained me in all facets of the industry before sitting for my Victorian License on discharge, strangely, a license that is still current, which was never actually used for a number of years. Whilst in the forces, the opportunity of becoming a technician and travelling to different areas, was too good to pass by, also it gave the opportunity to see Australia whilst learning the installation and commissioning techniques which were to become a way of life on discharge, with two major equipment suppliers, Western Electric (later Westrex) and Radio Corporation of America (RCA).

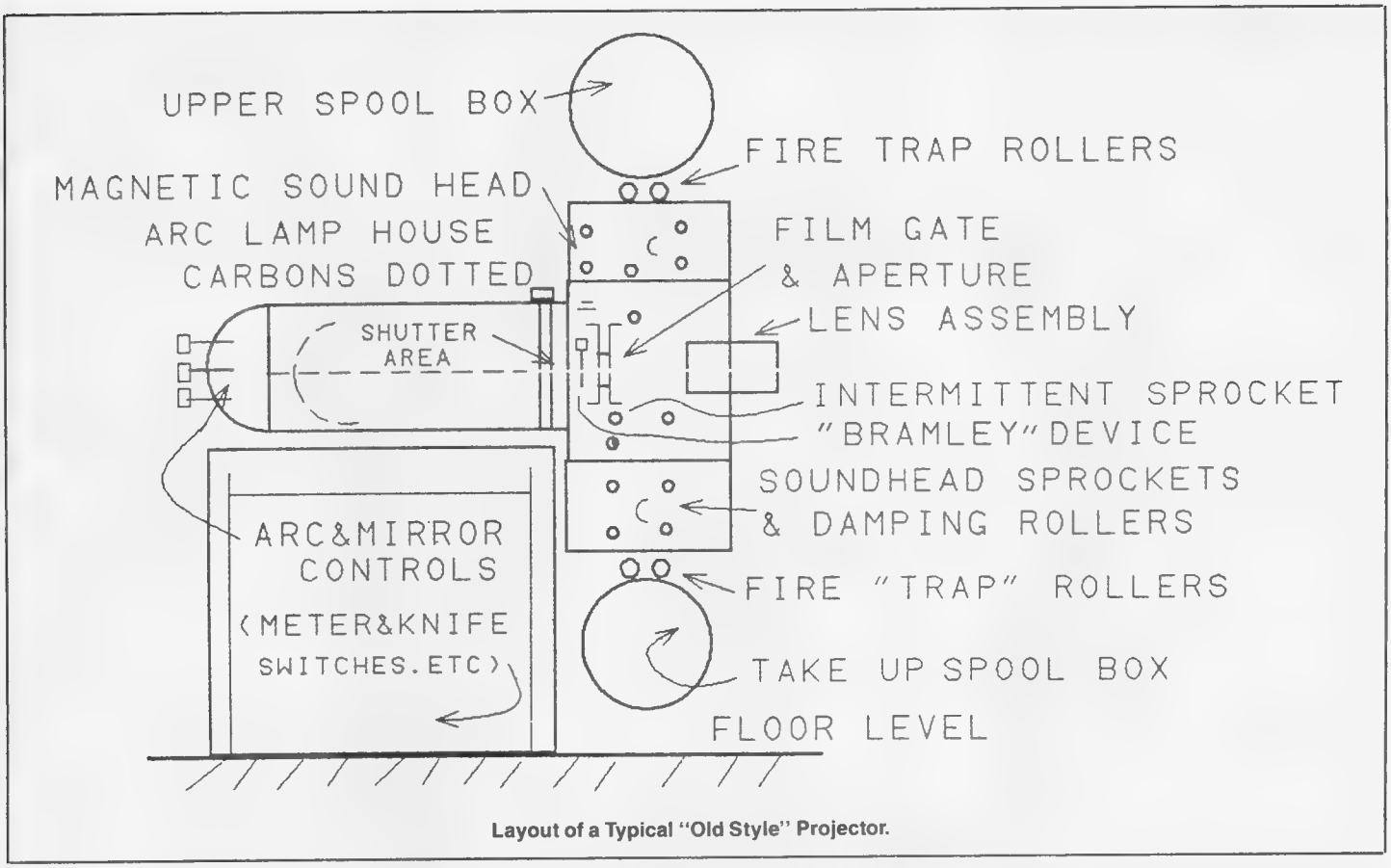
At the conclusion of this article, all projectionists who are known to have been engaged in the commercial projection of film, as the Victorian Act defines 'for gain or reward', will be listed. Many will be missed, some will have sadly become Silent Keys, therefore it is trusted that those whose knowledge is more accurate and up to date than mine will contact me, so an addendum may be placed in a later edition of *Amateur Radio*.

My first contact with the industry, commenced in a Victorian country town where the 'Movies' were screened each Saturday from a travelling circuit. The equipment was really quite simple, comprising two modular portable (well worn) Pyrox projectors with a 1000 watt incandescent lamp, shocking 'Top of the shelf' lenses which had ingressed a considerable amount of oil during their use, an unusual optical sound head (which also suffered the oil syndrome), a 10 watt amplifier using two trusty 2A3s in the final and a very portable, probably more aptly described as flimsy, screen and supply of at least 20 ten minute reels of film, as being of a portable nature it saved time in doubling them up and splitting them again after the screening, the maximum footage allowed in the spool box was 2000 feet (700 metres). The modules were assembled and held together by 'thumb-screws' allowing ease of erection and dismantling.

I became involved through curiosity for something to do on a Saturday night was the only entertainment for the week after working six days as a trainee draftsman at a milk processing factory. At that time, the older nitrate base 35 mm stock was still existent, and was even widely used for many years to come. As it was so volatile many safety precautions were introduced, including a device probably only used in Victoria which was known as the 'Bramley Device', named after its inventor. Many operators had various unprintable names for this device. The theory was excellent, but in practice, at times, it was activated by a faulty join, a strained sprocket hole or for any other strange reason. This device actually was a solenoid energised by voltage from the arc or light source that magnetically held up a metal plate allowing the light to pass through to the lens. In series with the circuit was a form of micro-switch which was in the closed position when two rotating spacers which were held apart by the film, in its path through the projector. A film break, caused the circuit to open, de-energising the solenoid, allowing the plate to drop (if it was not jammed in the open position by devious means) and the light with its intense heat was removed from the film, alleviating the chance of a potential fire.

Whether it was Murphy's law or the thoughts of an astute public servant who wrote the act, projection boxes for the exception of one or two, were elevated above the audience, and constructed to a fire-proof rating of a certain number of hours. Nevertheless, one learnt quite early in the business that film was heavy and quite a haul, to its holding area for the screening.

After a considerable period of initiation, a family move to the city led me to joining a large city 'circuit' as an assistant projectionist on a full time basis, of course this was to be my second job. Six nights of screening, a Saturday morning 'Cartoon Carnival', the usual matinee, an inter-



Layout of a Typical "Old Style" Projector.

mediate screening and of course the evening screening on the Saturday night. Sunday was a day of sleep and the cycle recommenced again.

Presentation was always uppermost in the thoughts of the projection staff, managers, usherettes and ushers, even to the 'lolly' boys who were all dressed and groomed immaculately. Every theatre was controlled by a circuit manager and superiors, that would grace the theatre at the most inopportune times, as did the Health Department Inspectors. Avid smokers were the Health Inspector's joy, even more so than those that did not have their licenses displayed. Each projection box had to be equipped with at least two large buckets of sand, a small shovel, highly polished brass fire extinguishers containing carbon tetrachloride (a fluid with a boiling point of about 77 degrees Celsius) which is now known to produce phosgene gas when placed on hot metal, a toxic gas that would exacerbate respiratory problems and direct contact through the skin of the fluid may cause hallucinations and incoherent problems as well as mental disorders, (always wondered and still do, why people shun me) and at least two asbestos or woollen fire blankets.

Each of these articles had specific purposes which they were not designed for, the sand buckets were a magnificent ash tray and particularly one well-known inspector would scratch away until he found a butt. Nevertheless it was a lever, as it was hard to prove that it was actually placed there whilst the theatre was open to the public, unless of course he burnt his fingers. Regardless, it would be written into the report. (Any self respecting projectionist who was a smoker, carried a tobacco tin in their pocket, which was the ash tray). The fire extinguishers were really never full as they contained fluid which was an excellent dry cleaning agent that assisted the usherettes to remove ice-cream stains from their skirts after interval, and there were some very clumsy employees. This was a chore that no self respecting projection staff member would allow the fair lady to do herself.

During those years, it was mandatory that a licensed operator, a registered assistant or another operator be in attendance at all times and at times another trainee may be assigned, to learn the ropes. With three, within very small confines, various ways were found to break the monotony. Generally each projection box had two 35 mm projectors, a slide machine, preamplifiers and the main amplifier. Using DC arcs from a motor generator or selenium rectifier with just enough capacity to run two arcs, meant that a switching device was needed to allow the load from the unused projector to be directed by knife switches to the slide machine, conveniently situated and within easy reach of all. Though a neat but frowned on trick by many operators was to 'snatch' the arc from the outgoing projector to the slide machine, which, when perfected, gave a film fade out and a fade in of the Interval slide.

In one certain suburban projection box located at ground level, the switches were located by the main amplifier. The amplifier being of an original 41, 42 and 43A Western Electric design, was rack mounted and at least two metres high, with the power supply comprising four 'huge' rectifiers which were about 75 mm in diameter glass tubes and about 250 mm high, glowing at full capacity that emanated heat excelling a couple of kilowatts, located about 150 mm from the floor level. These rectifiers were at times in the summer a little much, with the arcs running, nevertheless they did have their uses in the winter, as the usherettes came in to warm up before interval.

A couple of common tricks used to check a new employees calibre was to wind some heavy resin core solder around the unused lines to the slide machine or strategically place four small crackers that would harmlessly explode after the arc was struck! Of course it was prudent to check that the machine was lined up before the interval slides and no better person to do this chore, than the new recruit. This following experience and the subsequent look of horror, will live with me until I die. The command was issued, but what was not realised was that one of us had set the crackers and the other had set the solder. The order was carried out, but the rest is almost indescribable. The person saw smoke rising and sparks, which he handled quite well until the crackers went off. The face of the 16-year-old emanated that of Herman Munster, a quick look at the glowing rectifiers, out through the fireproof door into the foyer, one foot into the cleaners bucket and a slide across the foyer to the street. He eventually returned, very shaken and proved to be a very competent projectionist, service engineer and a well respected amateur. It is hoped he forgives the perpetrators of his initiation, when he reads this in print.

This particular theatre must have been staffed with renegades, as the manager, a massive man that completely filled a doorway, was also moonlighting and his days work was selling American cash registers, where all the sales staff started a chant before commencing work each day 'that they would produce better figures than their previous days work'. Over a weekend, for various reasons his world collapsed around him, and on the Monday morning, he went to the bank and converted all the takings into threepenny and sixpenny bits, placed them in a wheat bag and proceeded to the Victorian

Manager's Office. On entering, with celerity, he upturned the open bag on the Manager's table combined it is believed with some quite unprintable but very apt words. He has not been personally sighted since! The manager with a very cluttered office full of coins was it is believed, speechless, an attribute which was not consistent with the man's character.

On another occasion, the same theatre was screening a film called the 'Wooden Horse' and one of the sequences had at least a three minute period of silence. The first time it was encountered it was 'panic stations'. Amplifiers were hastily checked, the volume control was placed in the 'flat' out position, the 'port hole' window was removed to see that it was not the monitor amplifier, which had given up, the film track was checked for a sign of reproducable area (at a speed of 90 feet per minute this was not an easy task and meant a lot of film on the floor, which would all go back on the spool, if no one moved their feet). Then it occurred, a sound above all sounds and no member of the audience stayed on their seat. Later the manager, said it was a spectacular part of the film. I personally have shown that film a considerable number of times and have at times nearly placed the 'woofers' from the speakers, amongst the audience.

If one was in a city theatre, one learnt due to screening a film for a lengthy period, that the change from machine to machine was done by intuition, and there was also the competition of burning the carbons to the minimal length on a reel. As the carbon usage was proportional to the voltage and current, many tricks were played upon the unsuspecting opposite shift and at times there was no consideration to the audience to save a carbon holder.

It is interesting to note that most of the Western Electric equipment was used initially in the 'silent days', where the projector speed control was variable from the 16 frames per second to sound speed of 24 frames and above. In many locations the first sound facilities of a synchronised record player were in place but disabled.

Of course the 'Annual Movie Ball' was the event of the year and as the normal finishing time of the feature was 11 pm, half the fun and ones money, had been used by others. By soldering a 'bridge', across a 'solder tag', the variable speed was reintroduced to the projector. It was and still is, it is believed, to give the time of intermission and the end of the screening in the foyers of some theatres. Of course, unbeknown staff, sped-up the equipment, not too fast, but fast enough to allow us to leave about 40 minutes earlier than was expected. Many people came out into the foyer and checked their watches that evening, shaking their heads in disbelief, with the time shown on the clocks. Nevertheless it was better than dropping a reel or two out and really losing the continuity of all the program. (Incidentally the 'bridges' were removed before departing for the Movie Ball.). We would have been the first evening projection staff to arrive at the grand event and took great pleasure in greeting other staff as they arrived, consoling with them of the events of what they had missed.

Another incident, at the same theatre was a Mannequin Parade. It was well publicised, even to the extent of a senior evening newspaper photographer (still an active amateur and first class photographer) gaining the front page with one lass, that was decoratively decked out in a costume of the latest material. Such publicity, ensured a full house, and it was suggested that the resurrection of the 'arc-spot', from the generator room, below, would be appropriate. The spot worked magnificently with a pink coloured gel, the crowded theatre was stunned with the beauty beholding them — some of the mannequins with the new material which became transparent from the arc's rays, gave true X Ray vision and one arc-lamp was very quickly doused!

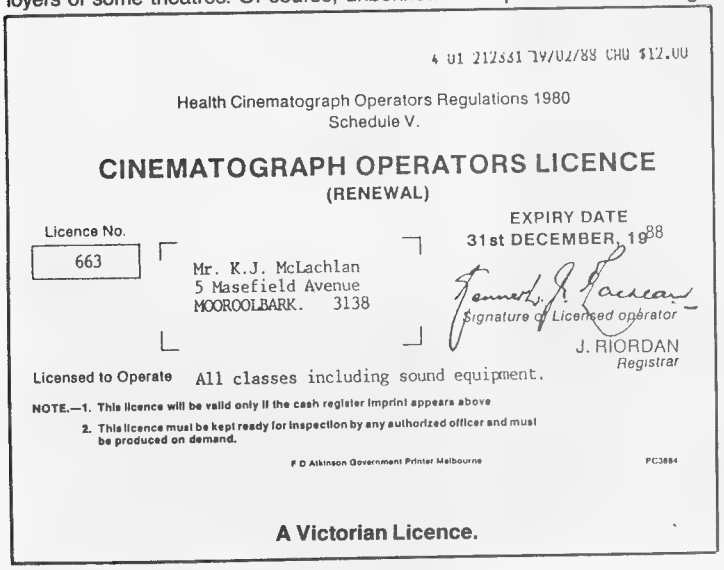
The projectionist and technical theatre staff, apart from these supervisors were also responsible to the Chief Projectionist Manager, an impeccably dressed man, who always wore a 'bow-tie'. When one was summoned to appear at his office in the city Head Office, they went with trepidation and the atmosphere created by a huge office and no offer of taking a seat, did not enhance the aura of goodwill. His charming personal secretary Marge, looking over her horn-rimmed glasses was the only gesture of friendship, with her warm smile and knowledge of every employee by their first name.

This gentleman had the habit of taking a constitutional walk around the city stores during his lunch break. On one of his tours he graced the premises of a well known hardware chain-store, to be served by one of his nightly staff. Then during a further tour of the store he found four more of his staff, filling in during the lunch hour rush. That evening the word was sent through the chains of command to the unhappy quintet for a morning meeting, next day. Word has it, that the whole of the city's main street were privy to the gentleman's remarks. Needless to say the hardware store was quite short of staff for that day and the days to come. He was the driving force behind the first Drive In Theatre in Australia, later leaving the organisation, constructing and running a successful Drive In Theatre for many years, which is one of the few presently left in the Melbourne metropolitan area. Its early success, was due to impeccably presented staff and a screening that was technically flawless and perhaps the 'bow-tie'. I was lucky, as he never suspected my moonlighting before joining the forces and even on my return to the company at a later date, and any of my many other misdemeanors, during my employment with the circuit.

Service life was a breeze, selection of the most up to date first film releases at the cheapest of hiring fees, your own staff and the service and upkeep of the equipment under ones care. Virtually one wore the 'coats' of exhibitor, manager, projectionist, service engineer, generally being only responsible to the Entertainments Officer, who was generally the Education Officer, (a great help to me as I was doing technical correspondence studies), except at one location where the Padre was the responsible Officer. One exceedingly hot Christmas Eve, this gentleman acquired adequate refrigerated refreshments and other 'goodies' for the whole staff from the Mess, a gesture that was typical of this Officer's rapport with all that met him.

My newly acquired position with my own theatre at different postings, was quickly lost due to promotion as a Service and Installation Engineer. Quite an exciting challenge, to fault find and install newer and much better equipment than the old Westrex, Cummings and Wilson, Kalee and other assorted equipment that was 'tied' together with what was at hand, in a typical amateur fashion.

At one base, located beside a lake, I had a 'ball', fishing and removing oysters from the pier and supports that the Sunderland Flying Boats in all their glory, were tethered too, during my off duty hours. Coincidently, a well known amateur from VK6, now a Federal Councillor, was doing his National Service at the same time. We never met, but through a chance remark in discussion, we have had many long discussions on the funnier side of life at that time, as it was an Officer Training establishment, everything on this establishment was done by the 'book', including morning parades. This is the only



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Health Cinematograph Operators Regulations 1980
Schedule V.

CINEMATOGRAPH OPERATORS LICENCE
(RENEWAL)

Licence No. 663

EXPIRY DATE
31st DECEMBER, 1988

Mr. K.J. McLachlan
5 Masefield Avenue
MOOROOLBARK. 3138

Signature of Licensed operator

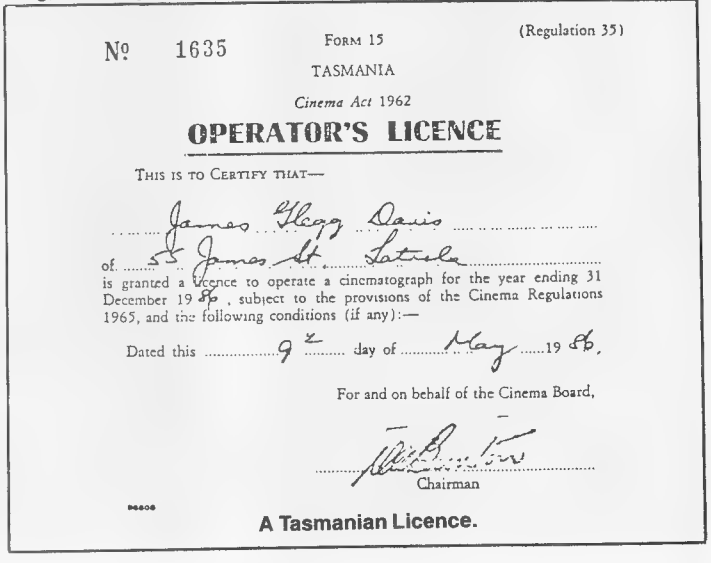
J. RIORDAN
Registrar

Licensed to Operate All classes including sound equipment.

NOTE.—1. This licence will be valid only if the cash register imprint appears above
2. This licence must be kept ready for inspection by any authorized officer and must be produced on demand.

F D Atkinson Government Printer Melbourne PC3884

A Victorian Licence.



No 1635 FORM 15 (Regulation 35)

TASMANIA

Cinema Act 1962

OPERATOR'S LICENCE

THIS IS TO CERTIFY THAT—

James Hogg Davis

of 55 James St. Latrobe

is granted a licence to operate a cinematograph for the year ending 31 December 19 86, subject to the provisions of the Cinema Regulations 1965, and the following conditions (if any):—

Dated this 9 day of May 19 86.

For and on behalf of the Cinema Board,

Chairman

A Tasmanian Licence.

'pastime', I was exonerated from being on the morning Roll Call and parade, it didn't worry me a bit as I rolled over in bed, for another half hours sleep, no longer though, as one may miss out on breakfast!

Another posting to a northern area theatre, was a comedy in itself, as I at times wondered if I was keeping the local theatre named 'The Star' running or the defense establishment's open air facility. Many friends were made, and everyone helped everyone else in that area, even to doubling as a Taxi Driver for a couple of hours, which taught me a lesson that would never be attempted again.

After a number of other postings, I was discharged and joined Western Electric as a service engineer in New South Wales where the installation of Widescreen formats was closely followed by the introduction of Cinemascope to the larger theatres in Newcastle and Sydney. It was a situation where one learnt as they went, (particularly not to place ones foot through the proscenium of one of Sydney's finest theatres, as I did), generally eating on the run and working 18 hours per day, seven days per week on installation, fault finding, commissioning and service to the existing clients that were waiting in the 'wings', with cheque book in hand, to see how magnificent these attributes would be to the Box Office, before purchasing. The equipment manufacturers just kept with the pace of the increasing demand, nevertheless the quality control suffered, placing a greater strain on the installation procedures and maintenance staffs workload. At times the installation staff, were still filing the apertures for the format being used, as the National Anthem was being played, and no one can get closer to panic than that, as in many types of machines, the aperture plate couldn't be removed whilst the film was in the projection gate. Many operators became nervous wrecks because of this small problem, as if during a changeover in format the correct aperture plate wasn't selected it meant stopping the projector completely and correcting the fault. Nicer brands of projectors allowed dowsing of the light, sliding the offending plate out and replacing the correct aspect ratio plate, five seconds to the experienced and hardened operator.

Some projectionists were frightened to death about the new 'black box' technique, quite often called other unprintable names, others took it in their stride. The former group couldn't come to grips with magnetic sound tracks replacing the variable density or variable area optical track that was synchronised in advance of the projected film, whereas the magnetic track was lagging behind the projected picture and there were four tracks which contained audio for three backstage reproducers, left, centre and right plus the side theatre audience participation speakers. This meant four preamplifiers and four main amplifiers with generally 807s, being used as the final audio amplifiers in the larger installations. It was too much, and the 807s were not the consumable type. The latter group assumed that when it didn't work it was the problem of those that put it there and they were thought to be as close as the telephone was. No way would they touch anything but the main switch and that was done with reluctance.

Work in the harbour city was very exciting, though hectic at times, particularly as the suburban layout was quite unfamiliar. An opposition company in Melbourne made a lucrative offer, which was accepted, as that is where the Drive In boom started and they were manufacturing most of the driver and final amplifying systems in modular form for rack mounting, which was quite a challenge.

Country maintenance duties was a not a new aspect and the chance of using that much valued privilege of the license that cost five shillings per annum, may be able to be used. It was never realised how much the law was flouted by some exhibitors on the country circuit due to sheer economics. An assistant operator was unheard of, however they were covered by the head usher, with a trainee assistants permit, who knew all the locals. Visitors to the area were treated with the respect of the usher making haste to and remaining in the projection box if there were any unusual sightings, though in Victoria the exhibitor had the Exhibitors Tax to contend with, and their inspections were quite regular, so at many times the projectionist had 'unneeded' assistance.

One country tour was never meant to be. Transport was by the trusty railway and bus system, not conducive to the carrying of a heavy tool box, spares and appropriate clothing for the planned weeks or on occasions, fortnights trip. Arriving in a distant town in the middle of a screening, depositing the necessary tools of trade, finding which 'flea-house' one was domiciled at, finding a meal and then the room that the 'know all/fix all' was booked into, was quite an art. Of course I was told a certain room number, no locks on the doors and, upon switching on the light. was greeted by a screaming lady, hiding under the bedclothes. A hasty retreat, finding the management and it was her mistake. That is my story and I am sticking to it.

This was my first and last trip in that direction, as it was catastrophic. The previous evening en route to this destination was the second time I had seen amateur radio, since I was 'knee high' to a grasshopper and had at many times admired Keith VK3SSs equipment located in the far left corner of his workshop/shop, which was close to my home town. It was then decided that one day I would follow in his footsteps and become a amateur radio operator. That previous evening, I had arrived in on the train and after finding a cafe to have a meal, I dropped into the theatre, to unload. The screening had commenced and all I could hear above the auditorium noise as I climbed the stairs was a repetitive 'clickety-clack'. The thought of a usual half hearted thump on the fireproof door with the comical announcement of 'Health Department', was dismissed from my mind as that was not a consistent projector noise. On juggling myself through the door, I was confronted by one of the most comical projection boxes I had yet seen at that time. It was conventional, except it had numerous additions of cotton reels used as pulleys, connected with different coloured strings running in all directions. This was my first and not the last initiation of a 'one' operator controlled projection box. In addition additional unfamiliar equipment, earphones and a strange device that was making the 'clickety-clack' noise, later I was to learn that it was some device that has always horrified me, a Morse key. Yes, it was an amateur, enjoying a QSO, whilst also enjoying his work.

Fronting at the theatre after an early breakfast, I was encountered by the 'cotton-reel' syndrome. Oblivious to all the extras, the projector, arcs, amplifier and other necessary equipment was thoroughly tested, the report written up, and I ventured on to a circuit of four theatres that I was later destined to manage. Believe you me, it was nice to be in conventional company, though the operators of the previous theatres initiative must be praised, for their ingenuity, that gave their patronage, a precisionally perfected performance, year in and year out for decades.

The Drive In and Wide Screen/Cinemascope boom had hit, long hours and deadlines (things haven't changed) became a nightmare. The company that I was employed by, were the leaders in the field and the workload was intensive. The first Drive In was 'put together' in record time. It was built on a creek bed, as the land was cheap. Opening night, after a heavy rain-storm was spent 'paddling', with many mutterings 'of hope the earths are connected properly' from the largest 'crew and onlookers', ever seen in one place at anyone time. Oh, such was Show Business.

Installations and commissioning tests were traumatic and at times very dramatic. At one installation as the workers left, the local children came over the hill, out of the sunset like a lot of Apache Indians. Heavy duty diesel rollers were drained of the oil which was replaced with the untamped stones. Unterminated speaker posts, if still standing, had the wires cut at the already covered conduits, supporting guys terminated by riggers before 'strutting the mighty screen', were appropriately cut and the mass of screen was caught by the wind, the damage couldn't be described but again the theatre opened on the scheduled date.

At one inner suburban theatre situated on a main suburban road, selected for the change over to Cinemascope over a weekend, conversion was completed on the usual death knock and had survived all the usual tests. The opening line of the prelude to The Robe, was "Now we present Cinemascope . . ." with curtains dramatically opening to a new screen ratio, accenting the new format. This procedure was well embedded in every Theatre Engineer's mind. On this occasion, whilst standing outside the projection box at the top of the aisle, the curtains opened and 'Car ? to Car ?. We are going in to see this new finagled picture'. Definitely my first case of RFI (and unfortunately not my last) from no one else than a police vehicle and on all the four amplifiers. It brought the 'house' down with laughter, but the very red faced including mine, technicians, laboured for one week to rid these pestacious varmints noises from occurring again.

Strangely another unusual incident occurred in the same area whilst leaving an installation of a dreaded Perspecta Sound system, for an opposition company. This system would have been a delight to Lloyd VK5BR, an expert in his own right on filters. It was a purely optical (el cheapo) system based on controlling the left, centre and right speakers (no audience participation speakers) by a 30, 35 and 40 Hz cycle control signal being imposed on the sound track. It never worked as it was intended, for more than half an hours duration and if that, one's luck was in. It was doomed to be a disaster from its inception and the first picture on this system was a musical concerning the Canadian Mounties. Nelson Eddy moved from the left side of the screen with his voice emanating from the right. This was typical of the installation as another technician and the writer were leaving the theatre at about three o'clock in the morning, of course with a small oxygen bottle to be refilled before returning later that day, when we were greeted by two very large gentlemen in blue uniforms. We got home for breakfast but the intervening hours events are left to the readers imagination, as the onus was on us to prove our

innocence and the reason for being on the premises, particularly with such equipment.

Earlier in the article, mention was made of a Health Inspector, who is now unfortunately deceased. This gentleman was one of the fairest, honest and most helpful gentlemen I ever had contact with. I forgave him for the 'trick' he played on me with an accomplice during my practical Licence examination, which was replacing the copper coated arc carbon with a suitably painted piece of wooden dowel, after a very nervous tour of my explanation of various equipment in the Motor Room. The transposed 'carbon' was detected prior to the crucial moment. He also did eventually pass a candidate, who repeatedly answered the standard Regulation Paper question 'Note in sequence the steps you would take in the case of a fire'. The answer of 'Very fast ones ...' and similar answers was not very appropriate at each exam he presented himself for.

During my active time in the industry, I was conned into being the relieving 'sparks' at a vaudeville type show in the well renowned Tivoli Theatre, since closed and well demolished, as most of the old theatres have become in this State. I had spent a fair amount of time amongst the numerous lighting circuits, dimmers and all the knick knacks that go up to make a performance. At times one had to be very dexterous to operate a number of dimmers, spotlights and effects that were used to make the dancing girls appear more beautiful. Originally it commenced as a three performance stint, ending up in virtually about fifty, due to the electricians sickness. It was a different scene to the pictures, but it was 'Show Biz'.

Another variation, was one of the original Film Festivals that was held at the theatre in the Melbourne University where an incident occurred between the very artistic director and yours truly. The audience and staff, including one amateur (now interstate) who was working in the projection box during the festival whilst studying on campus, were all involved. The festival screened films virtually from 9 am to 11 pm for 15 consecutive days. Everyone was tired and tempers flared at many times, nevertheless this particular evening was too much for us all and it commenced quietly and ended in a very verbal altercation in the foyer, which attracted a larger audience than the sub-titled film that was being screened in the auditorium. Many years later we met, and had quite a laugh about our difference of opinion. After the completion of the festival, I stayed on with the theatre in the capacity of projectionist and the 'sparks' for the live shows that were presented. Incidentally the world premiere of John Sumner's world acclaimed production 'Summer of the Seventeenth Doll', was inaugurated from this location, which had many and varied audio enhancements anywhere from backstage to the projection box and most of the final amplifiers used the trusty and much loved 2A3s.

No article would be complete, without the Health Inspector's remark regarding an incident that occurred to him before his retirement and subsequent untimely death. He was making a routine visit to a suburban cinema and noticed a person in white overalls working under the bonnet of his car, beneath the street lighting outside the foyer. As of his nature and thinking he may be able to be of assistance, he placed his head under the bonnet for a chat with the 'mechanic', who was happily working away as this cinema now used extended reels, Xenon lamps and no 'paid' assistant. The operator instantly recognised his unsolicited helper, with

CINEMATOGRAPH OPERATORS EXAMINATION

GENERAL PAPER

1. (a) Describe the Department of Health Public Building Regulations governing Cinemas during public occupation, concerning the prevention and/or isolation of fire.

   (b) Name two other areas in a Theatre, where other fire prevention measures are required to ensure public safety under these Regulations.

2. Having a projector lens of 4" (102 mm) focal length, a projector throughput of 100' (30.48 metres) and an aperture plate of .472" (11.9 mm) in height, what will the height of the picture be on the screen? (Show all calculations).

3. (a) Describe the effect of travel ghost has on a projected picture?
   (b) What causes travel ghost?
   (c) How would you remedy the problem?

4. (a) Describe in detail the procedure you would adopt as normal maintenance to either a Xenon Lamphouse or a Carbon Arc Lamphouse?
   (b) What precautions should be taken while handling a Xenon Lamphouse?
   (c) Why must care be taken while handling a Xenon bulb?

DC PAPER

1. (a) Define OHMS law.
   (b) Give three formulae for voltage.
   (c) Give three formulae for wattage (power).

2. Direct currents:-
   (a) Define direct current.
   (b) What is pulsating direct current?
   (c) Which of the above (a) or (b) will pass through a transformer and why? (Brief answer).

3. Xenon lamps:-
   (a) What are types of currents used to ignite and run Xenon lamps?
   (b) How are the electrodes shaped in a Xenon lamp?
   Draw and mark their polarity, also show a horizontal lamp in place with mirror.
   (c) What is the expected voltage and current rating for a small Cinema.

ALTERNATING CURRENT

1. (a) Describe with diagrams:-
   (1) Auto transformer.
   (2) Step up transformer.
   (3) Step down transformer.
   Clearly indicate their construction and give an example where each would be used.
   (b) Explain two main losses, which affect the efficiency of transformers and methods used to reduce these losses to a minimum.
   (c) Does a transformer take any current when the secondary circuit is open? If so, why?

—Examination Papers courtesy John Riordan, Registrar, Victorian Cinematograph Operators Board

2. (a) State which instruments where current and pressure (potential) transformers, respectively are used. Draw a diagram showing circuit connections of either instrument, fully describe all components and the principle of operation.

(b) If a step-down transformer with a 2 to 1 ratio has an efficiency of 90 per cent, what would be the secondary voltage and amperage when the primary is supplied with 100 amps at 100 volts.

SOUND

1. (a) How is amplification in a transistor achieved?
   (b) Draw an NPN transistor showing polarity of connections.
   (c) Why is the term "common collector" used to describe a certain transistor circuit.
2. (a) An exciter blows and is replaced - you have time to make adjustments if needed - briefly describe your method of checking and adjustments if absolutely necessary.
   (b) What is the azimuth adjustment.
3. (a) What precautions must be taken by you and/or serviceman when working on solid state amplifiers (including the use of soldering irons)?
   (b) Using meters?
   (c) Working in a newly carpeted area?

Some typical Victorian Licence questions.

panic. They amiably discussed and fixed the problem. They parted amicably and the operator made a hasty return to the equipment by the emergency exit and awaited in fear and trepidation for the Inspector via the conventional access through the theatre. On entering the projection box he produced his credentials, shook hands, made the remark that the face was familiar. On completion of the inspection, he succinctly wished the operator all the best with his car and a safe trip home. For the second time in his life, the operator was speechless. The first was when he was my assistant in a city theatre, whilst unbeknown to me, between 20-minute reels he decided to discover what the interstices were like in an Anamorphic Lens, which is a complicated assortment of lenses and prisms that create a compressed image from the film into a legible screened Cinemascope picture. No audience member knew, unless they overheard the conversation through the soundproof walls, nevertheless it took a complete shift to line the lens up correctly and that was more by sheer good luck than management.

Strangely, earlier at this theatre I had been the operator, and due to surgery, it was not prudent to lift or move around too much. My wife Bett was registered as a trainee, and carried on the work whilst I minded our four children in an Audio Control Booth adjacent to the projection room. During this period, there was a special screening for the non-working projectionists on a Sunday afternoon. Bett did the lot without a hitch, including suffering the indignity of a take-up reel drive failure, necessitating the film to be hand wound for the period of the reel's screening. Against all regulations, I learnt at an early stage of my career to leave all doors of the equipment open when running. With a film break, the celluloid always had somewhere to go, instead of packing itself into the projector, necessitating virtually a hacksaw to free it all. Apart from the bent shafts and loss of film, that was left in the wake of such a catastrophe. I had seen many, but luckily it never happened to me.

Another incident at this theatre, was that the late Arthur VK3AM, who had agreed to assist by doing some relief for me, during a telephone conversation. Arthur came along to see the workings as I was changing over a three phase motor on which the wiring was still alive. Arthur, delicately suggested that another operator would be more suitable as he was not used to Xenons, complicated audio equipment, the risk of electrocution or the joys of dressing up in 'protective clothing', looking like the man from Mars, in the unlikely occurrence of having to change or adjust a lamp, because of its impulsion characteristics which could wreck a lamphouse on ignition. One learnt quite quickly, when once lit, they stayed that way until the end of the screening, though the output was reduced whilst not in use.

The scene and role of the projectionist has changed dramatically over the years with the advent of modern technology and most modern cinemas have the whole program on one flat platter of film and the projection equipment is programmed for the opening and closing of curtains, control of the lighting and music. In other words, find a good book or magazine (*Amateur Radio*), press a button, sit down and relax. Nevertheless, a thought should be given to the pioneers of an industry that has been adequately staffed and nurtured to the stage it is by technology and radio amateurs from all countries that have made a significant contribution to the 'Silver Screen', which has provided millions of hours of enjoyment to so many since the 'silent days', where the music was supplied by a pianist.

As previously mentioned the opportunity of managing a country theatre complex in four towns, being manager/projectionist of one, was too good a position to pass up. Comical as it may seem now, the first week in this position was quite traumatic. Part of the countryside was a high intensive fruit growing area, that was well renowned at times for being a riotous behavior area even to the extent of the constabulary being dramatically increased. This influx was a bonanza for any form of entertainment and the local theatre had no competition. The 'Full House' sign, meant nothing to one character on the first night of my new duties as he was determined to see the film, and he brought his rifle along to assist him gaining a 'seat, through the side exit door. For his trouble he received a seat and a bed in the 'cooler' until the next sitting of the court.

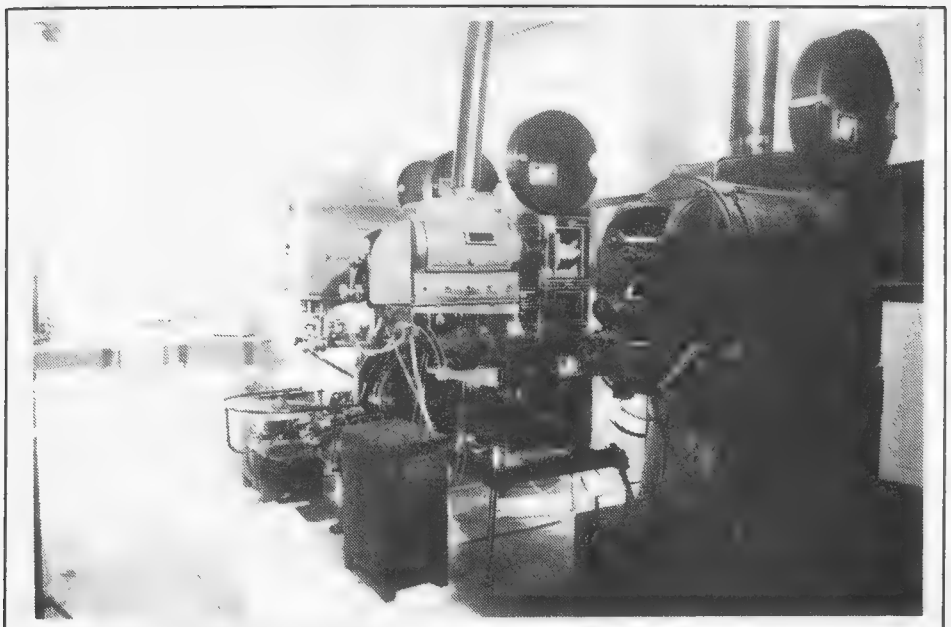
That was the start of the week, on the Saturday evening the local publican had his usual block of seats booked. After interval he advised the usher, that he was going home with his family and locking the hotel up. On checking, the patron in the next seat had deceased and the Innkeepers Act had a clause that if a morgue was not available, the nearest hotel must accept the body of a deceased person until an autopsy can be conducted or arranged by a Coroner. Yes, we did see the hotelier that evening, and into the early hours of the next morning. It was an unusual way of getting to know the local constabulary over a convivial drink from the top shelf, at the hoteliers expense and quite out of hours. No one was complaining at the publican's hospitality.

Whilst in this area, one of the Theatre Managers rang about midday on a Sunday to advise that he had lost the majority of the weekend's takings. After the initial shock, and some questioning, it was found that he had come home from the theatre and placed the money in the oven. His wife lit the stove to cook the Sunday roast and when he awoke he discovered a charred mess. A fairly lengthy trip and after a lot of piecing together only one or two pounds were lost. He found other areas for future safekeeping, of the 'weekend' loot. His wife, was so upset that she required medical treatment. Neither of the couple spoke about it for months, but it was one of those things which just happened out of the blue, and like most other misfortunes, can be laughed about for years to come. Anyway it was only money!

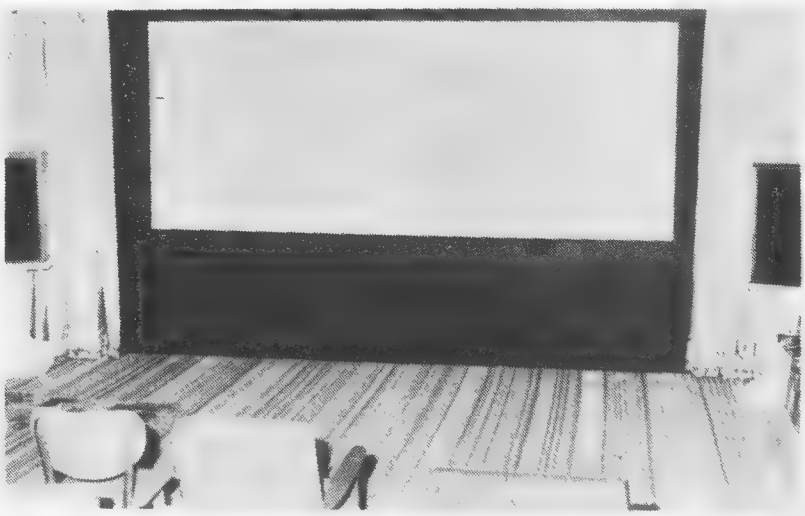
By chance, I joined another country circuit, which was moonlighting an electrical and radio service position, doing the theatre work at night. It was here I met Rex VK3VL, who connived me into sitting for the Amateur Examination, in which I was successful and I express my sincere thanks to Rex, for his persistence in 'twisting my arm' of sitting for the examination and giving me the privilege of holding a license which has given me great pleasure for in excess of three decades.

Back to the city, to my profession, however the magic of the theatre and the money attracted more moonlighting, in Drive Ins and Hard Top Theatres. The Drive Ins had numerous hazards such as cars driving off with the speaker still attached, cars with flat car batteries and on many occasions the decision of how to delicately and unobtrusively find a way to wake couples, asleep in cars who were of course quite oblivious to the fact that the screening had ended. This was generally done whilst checking all the speakers in readiness for the next evening's screening, commonly being termed the 'ramp tramp'.

Many other operators have varied stories to tell, one I know was probably at one of the first open air cinemas, as I was in Darwin, for a short time. Another operator, who was only qualified to



Some of Jim VK7OW's collection of projectors that grace his Biobox. Included are a 1927 'Synch-Sound' projector which screened the first 'talking picture' in Tasmania.



Jim VK7OW's Cinemascope screen with the tabs open. Each of the two speakers shown contain a 12 inch Low Frequency Woofer, a 13 inch by six inch mid-range horn and two 'tweeters'. Behind the screen is a 1927 vintage Western Electric multi-cellular HF Horn with a 555 driver, a Huee 17A Midrange Horn with a 555 driver and two 18 inch Electro-dynamic LF units with the original cross-over network.

16 mm standards, went to an island's defense station. He didn't like the position of the open air screen and had it shifted, however the 100 mm x 100 mm wooden stanchion supporting the home of the projector was 'smack' in the centre of the projected beam. A saw soon removed this obstruction and the consequences were the loss of the shelter and the demolition of the projection equipment. The prudent Commanding Officer had him on the next transport headed south, accompanied with a strong referral for discharge, negating an undue load on the taxpayer. This person has and is still trying to gain a seat in politics, maybe for retribution.

One amateur is known to have operated in England in a various number of theatres, nevertheless he did some prestigious performances, however he was not enthralled of a future of looking out of, as he describes 'little holes in the wall' for the rest of his life, as he would end up as crazy as the people on the screen. Other operators I have received information from vary from descriptions of the equipment that they use or have used and one operator Jim VK7OW, has created a private collection and has his own private theatre at home. Jim designed the home he lives in and of course he incorporated his theatre which is about 20 metres long and eight metres wide. Seating is for an audience of about 50 people who are treated to the ultimate in excellence. Acoustically corrected and balanced auditorium characteristics, motorised curtains and masking when changing formats, dimming lights and controlled background music from either reel, cassette or disc which is fed to — wait for it — an American Bogun Cinema amplifier complete with a five stage equaliser fed to a Raycophone 100A amplifier using 2A3s as finals. The screening of an eight metre Cinemascope picture, sound which is presented by six speakers at the screen and three audience participation speakers on each side of the auditorium. The Biobox is equipped with five restored and compatible machines that have been acquired from around the State. The arcs are AC, drawing 45 amperes at 25 volts with an eight inch mirror. As this article with the magazine will be distributed to the major film tradehouses, be prepared for a take over option, Jim.

Incidentally, there is a lot of the very vulnerable nitrate film still in lofts, garages and supporting floors of houses. Titles of these films include many Cinesound releases as Newsreels and features such as 'The Ghosts of Port Arthur' which includes some of the original footage of the Australian classic 'For the Term of his Natural Life', where the renowned names of Ken Hall, Bert Cross, Arthur Smith and Bert Bailey and others made their mark on an industry which received very little recognition from entrepreneurs, or subsidies from the government of the day. Really, the technological advances from recording to presentation have been dramatic, so why has the present talent of directors, cast and crew been forced to use their talents in other countries and exporting their product back to where they were born, educated and strived for an existence?

It is recommended than any nitrate film held by any reader should be documented and the information forwarded to the National Film Archives at the National Museum in Canberra. This film may be just the missing link to combining and restoring a full length feature for transferral to another and much safer base. Also, one's comprehensive building and householders insurer would be quite happier at lessening the chance of a mishap. A quantity of this volatile material, which whilst stored in particular circumstances may even nullify some insurance contracts.

I personally have no desire to re-enter the industry, or even a theatre for that matter and probably the managements of many theatres have the same feelings about me, nevertheless my contribution to the government coffers will benefit from the renewal of my license each year, which commenced with the 'Princely' sum of five shillings per year and is now $12 per year.

The saying 'There is no Business like Show Business' is so true and no matter what, the 'show always went on' and personally it is believed this will continue for many years to come.

Like the familiar Bugs Bunny cartoon ending, 'That's all Folks'.

Some of the amateur operators and individuals who are known to be or have been commercial exhibitors, projectionists or persons with a genuine interest in preserving some of our heritage which was documented on film and assisted with this article are:
Betty Cooper, Chris Long, Ken Burns, Rick Wynne-York, Roy Ramsey, Peter VK3KAU, John VK5ZFO, Jim VK7OW, Syd VK7SF, Norm VK3EQ, Gordon VK3AGE, Rick VK3RC, Ken VK3AH, Stan VK3AGT, *Arthur Forecast VK3AM, *Ken Rankin VK3KR, Jack VK3AJY, Geoff VK3AC, Gil VK3CQ, Ron VK4BUR, John VK2ZHM, Bren VK2BJC, Athol VK7LR, Harry VK3XI, Paul VK6OF, Rupert VK3BJN, Bill VK3EG, Keith VK4KH and Leo VK3DX.
*Denotes known to be a Silent Key.

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STOIC WIRELESS OPERATOR CONTINUES TO TAP OUT MESSAGES

On Wednesday, April 10, 1912, the SS *Titanic* left Southampton on her maiden voyage. Five days later, she lay a useless mass of twisted and torn steel on the bed of the ocean, for on April 14, 1912, at about 11.40 pm, she struck an iceberg whilst on her maiden voyage to New York.

The blow to the starboard side of the ship ripped a hole 300 feet long and within three hours she foundered in water two miles deep.

The wireless was working perfectly at the time and the captain ordered Mr Jack G Phillips, Chief Marconi Operator, to send "the regulation international call for help. . .". Mr Phillips then began to send the signal CQD and later SOS.

The *Titanic's* CQDs and SOSs were first heard by the German steamer, *Frankfurt* which was 153 miles away. Almost at the same time, the *Carpathia's* wireless operator reported the emergency to his captain and was able to give the stricken liner's position as 41 46N 50 14W. Immediately, the *Carpathia,* which was 58 miles away, altered course to the rescue. The first message the *Carpathia* picked up was, "COME AT ONCE, WE'VE STRUCK A BERG. IT'S CQD. OM CQD." (CQD meant Come Quick, Danger and was rather tricky to tap out in Morse code. For this reason, the now universal distress SOS was also used and this was the first occasion it had really been broadcast in earnest). Soon, at least six ships were steaming to the disaster zone.

Two long hours elapsed before the *Carpathia* arrived and began to pick up survivors. Among over 1 500 people lost on that fateful night was Jack Phillips, the *Titanic's* senior wireless operator, who remained at his post as the decks were awash. Mr Harold S Bride, second wireless operator, showed equal devotion to duty and was eventually rescued after nearly two hours in the sea.

As the decks were awash, Mr Phillips was standing in the wireless room sending details of how the *Titanic* was faring to the *Carpathia.* As Phillips was sending, Harold Bride strapped his lifebelt to the wireless operator's back. He had already put on his overcoat and was wondering if he could get Phillips' boots on him while he was still sending.

The Captain released all men from their duties but Phillips continued to send. He continued sending for about 15 minutes after being released by the Captain — water washing the floor of the wireless cabin.

Jack G Phillips, Chief Marconi Operator on board the *Titanic*.

Eventually, Jack Phillips ran aft and made his way to the deck. He swam to a life-raft but lay there exhausted until his last breath failed. Harold Bride later said of Jack Phillips. "He was a brave man and stuck to his key until the very end. If he had had a chance to go to his room and get warmer clothing, as I did, he would probably be alive today. But duty was first with him."

PMG COMMENTS

The Right Honourable Herbert Samuel, MP, Postmaster-General, referring to the disaster at the dinner of the London Chamber of Commerce on April 18, 1912, said:

"Those who had been saved had been saved through one man, Mr Marconi, whose wonderful invention was proving not only of infinite social and commercial value, but of the highest humanitarian values as well."

Parliament had given the Postmaster-General complete control over the use of wireless telegraphy, and no one could operate or establish a station without the Postmaster-General's licence, which was only very sparingly given, and for purposes of experimentation and research and under such conditions which precluded disturbance of commercial or humanitarian messages. Round the coast, in charge of his department, there was a girdle of wireless stations which were in constant communication with the telegraphic services of the country and with life-saving stations. No fewer than 400 liners had been equipped with wireless apparatus, including some cargo vessels. All the operators on these ships were required to hold a Post Office Certificate of Efficiency, and to answer immediately any signals of distress, and under conditions which, as far as possible, precluded interference with one another.

DAVID SARNOFF

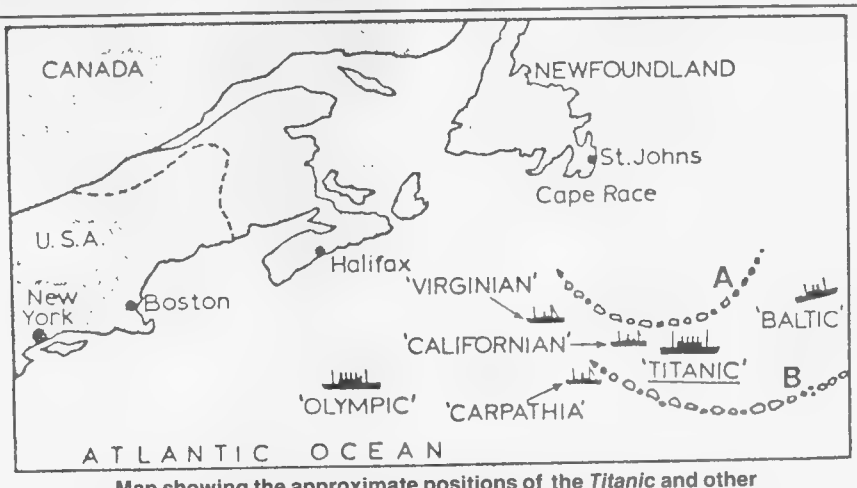
David Sarnoff was on duty at the Marconi Wireless Telegraph Company of America station at Saisconset on Nantucket Island on April 14, 1912. He stayed on duty continuously for 72 hours so that he could relay message from the rescue ship to the rest of the world. (Brigadier General David Sarnoff, was born is a small village near Minsk, Russia, in 1891. He was a former Chairman of the Board of RCA and passed away on December 12, 1971.).

TITANIC EQUIPMENT

Radio equipment on the *Titanic* was the most powerful possessed by any vessel of the mercantile marine at the time. It's generating plant consisted of a 5 kW motor-generator which yielded current at 300 volts 60 cycles. The motor of the set was fed at 110 volts DC from the ship's lighting circuit. Also, an independent oil-engine set was installed on the top deck, and a battery of accumulators was also provided as a stand-by. The alternator of the motor-generator set was connected to the primary of an air-core transformer, and the condenser consisted of oil-immersed glass plates. To eliminate spark-gap and its consequent resistance as much as possible, a Marconi rotary disc discharger was used. This was driven off the shaft of the motor-generator.

The guaranteed working range of the equipment was 250 miles under any atmospheric conditions, but 400 miles was not uncommon, while night-time range frequently increased to 2 000 miles. The aerial was supported by two masts, 200 feet high, stepped 600 feet apart, with a mean height of 170 feet. It was used in the dual role of transmitting and receiving. The earth connection was made by insulated cable to convenient points on the hull of the vessel.

The receiver was a Marconi magnetic travelling band detector used in conjunction with a multiple tuner, providing reception of all frequencies between 100 and 2 500 metres. The multiple tuner was calibrated to permit instruments to be set at



Map showing the approximate positions of the *Titanic* and other ships at the time of the disaster.

White Star Line

TRIPLE SCREW ROYAL MAIL STEAMERS

"OLYMPIC," 45,324 tons, and "TITANIC" 45,000 tons, are the Largest Vessels in the World.

(Fitted with Marconi Wireless Apparatus.)

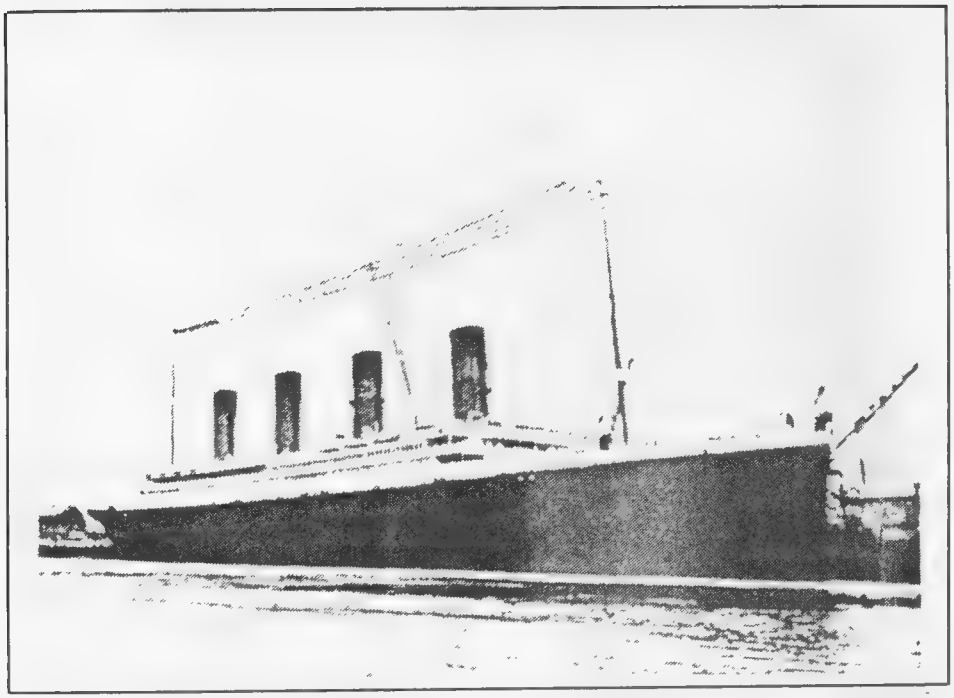
"OLYMPIC" sails from Southampton and Cherbourg to New York regularly.

"TITANIC" sails from Southampton and Cherbourg on first voyage to New York April 10, 1912

White Star Line

LIVERPOOL, LONDON, SOUTHAMPTON, NEW YORK

Maiden Voyage of the *Titanic* advertisement.



The *Titanic* leaving Southampton. The wireless aerial can be clearly seen.

any prearranged wavelength and was provided with a change switch to permit instantaneous change of the circuit from a highly-syntonised tuned condition to an untuned condition (for stand-by) especially devised for picking up incoming signals of widely different wavelengths. Due to robust nature of the magnetic detector it could be employed permanently connected to the transmitting aerial, thus dispensing with all mechanical change over switching arrangements.

MARCONI'S COMMENTS

Mr Marconi was called to give evidence at the Board of Trade inquiry into the sinking of the *Titanic*. He stated that there were two possibilities whereby a continuous watch could be kept in the wireless room to listen for SOS signals. The first was to give a member of the crew sufficient training to be able to recognise distress signals and place him on listening watch whenever the wireless operators were not on duty. The second was for the development of a device which would sound an alarm bell whenever an emergency call was received. (This auto-alarm apparatus was eventually proved in experiments and came into use after World War I).

Although the survivors of the *Titanic* disaster marched *en masse* to honour Marconi at his hotel in New York, he always felt that his invention should have done more. He realised too many ships had wireless equipment far too weak and that certain wavelengths must be set aside exclusively for different kinds of wireless messages.

The Marconi Company made its first commercial installation on a merchant ship in 1900. In 1910, over 100 new installations were made, bringing the total number of Marconi-equipped ships to 250. Communication was exclusively by Morse.

Transmitting equipment was mostly housed in a "silence cabin". Considerable noise came from the spark and the rotary converter that powered it. A wavelength of 600 metres was used almost exclusively, though by law the equipment had to be capable of operating at 300 metres.

During ocean voyages, ships were at time out of reach of shore stations and messages had to be relayed by other ships. To facilitate this, Marconi Company issued monthly "Communications Charts" for the main transoceanic routes, showing the passages schedules for Marconi equipped ships.

—The above article has been compiled and condensed from articles in remembrance of the *Titanic* disaster, which originally appeared in *Practical Wireless* May, June and July 1972, written by Colin Riches and Arthur Dow. These articles were forwarded to AR by Robert Dew VK1DE

—Compiled by Bett McLachlan

A REMOTE CONTROL ANTENNA SWITCHING SYSTEM

Bill Duke VK2WD
44 Avian Crescent, Lane Cove, NSW. 2066

With up to four HF antennas in use, it was decided to remotely control each antenna by feeding them to a relay box, by a single coaxial line, to the operating position.

The relay box contains two DPDT relays and five SO239 sockets. At the operating position there is a box with a three-pole four-position wafer switch and four LEDs to indicate the antenna in use. A two conductor cable, in conjunction with the shielded outer braid of the main coax, feeds 13.8 volts, taken from the transceiver power supply, to the relays. This should be made clear by reference to the circuit diagram.

OPERATION DETAILS

Switch position 1 — both relays are passive connecting antenna A.
Switch position 2 — relay No 1 energised connecting antenna B.
Switch position 3 — relay No 2 energised connecting antenna C.
Switch position 4 — both relays energised connecting antenna D.

The relays are Archer catalogue No 275-2188.

The system has been in use for over 12 months on frequencies from 28 to 3.7 MHz with entirely satisfactory results.

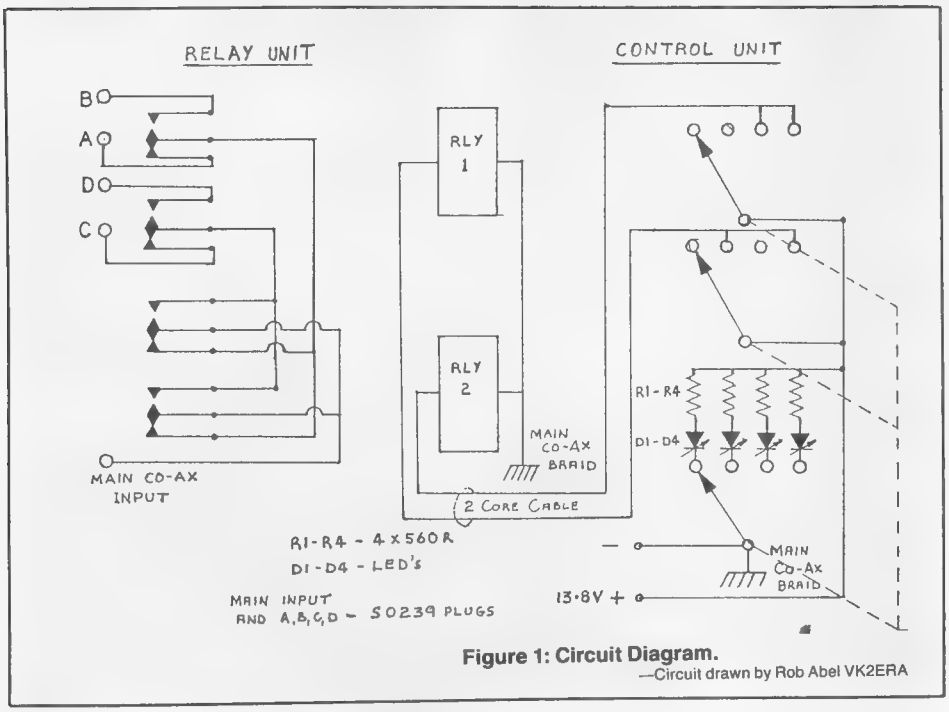


Figure 1: Circuit Diagram.
—Circuit drawn by Rob Abel VK2ERA

DISCUSSION ON OPEN WIRE FEEDERS AND BALANCED OUTPUT ANTENNA MATCHERS

Dean Probert VK5LB
RMD Verrall Road, Hope Forest, SA. 5172

There are still amateurs who use balanced feeders for a variety of reasons!

AFTER READING THE excellent article by Lloyd Butler VK5BR, in June 1987 AR, it occurred to the author that the majority of the text deals with coaxial (unbalanced) output matching units. Unbalanced output matchers, ie transmatches enjoy almost exclusive popularity due to the widespread use of coaxial line as a feeder from the transmitter, or the matching unit, to the antenna. However, there are still amateurs who use balanced feeders for a variety of reasons. There are probably many more who would use them if they were better understood.

Lloyd provided detail on balanced tuning which used a balun in the input circuitry. Limitations on the use of baluns prompted Lloyd to recommend a suitable toroid selected for the frequency range and with sufficient core cross section area to prevent core saturation. The use of a balun in the *output* of an *unbalanced* matching unit drew the following comment which is worth re-printing:

> "The problem here is that the transformer would not only have to be designed for a wide range of frequencies, but it would also have to be made to operate over the wide range of output impedances, a somewhat difficult proposition."
>
> (Butler L. AR, June 1987)

This timely warning reminds us baluns must be used with care. There are literally dozens of authorities to support this statement including M Walter Maxwell in *QST*. See Bibliography and, in particular, *QST* April 1973, page 39, "Another Look at Reflections." This series of articles are valuable reading and are strongly recommended.

Just to reinforce the point a little more, most antenna matching units provide a *direct* electrical coupling for a 50 ohm load. For example, a transmatch provides an unbalanced output unless a balun is used. A toroidal balun is generally employed but care should be taken in the selection of the core material, to prevent core saturation and damage due to non-linearities at high flux densities. (Sevick *QST* 1976, page 23). Also attention must be paid to wire size and insulation to prevent voltage breakdown. Remember, under severe mismatch conditions, high voltages may be present. Also, ohmic losses can be high. Toroidal baluns should only be used within their power ratings and not in the presence of *high SWR* especially over a wide range of frequencies. (Maxwell *QST* 1973, page 39). As long as these limitations are appreciated a toroidal balun is an excellent broadband coupler for balanced to unbalanced loads, or as an impedance transformer for stepping Zo levels up or down.

The question is, do we need to use a balun at all? This depends on individual installations. When using a multiband antenna, a matching unit will be able to present the transmitter with a "perfect match". It also will, when set to the correct values, attenuate harmonics from the transmitter. (ARRL Handbook 1982, page 19-10). Matching networks have a passband response for the frequency to which it is set. However, there may be several settings of capacitance and inductance which will give a 50 ohm "match". A transmatch may degenerate in it's harmonic attenuation, die to the way it is adjusted in part, and exhibit a high pass response. (ARRL Handbook 1982, page 19-11). By the way, the use of maximum capacitance and minimum inductance provides the best attenuation. (De Maw, *QST* February 1976, page 27). Is there an alternative then to using coaxial cable and a transmatch? There is always the balanced feeder. Open wire line has fallen out of favour and is, to some extent, misunderstood. It is thought to be prone to line radiation due to high SWR figures generally thought to be a characteristic of open wire line feeder. This aspect is more thoroughly dealt with later in this article. The author proposes that the use of a balanced output antenna matcher and balanced line feeder is still a very good option open to operators using modern equipment. The reasons are given in the following text. Let us look at line losses, effect of SWR and conjugate matching.

TRANSMISSION LINE LOSSES

Losses in transmission lines depend on several factors; ie the size of conductors, the spacings between the conductors, the dielectric material used in the construction of the feedline and the frequency at which the line is to be used.

Coaxial lines can be considered to be lossy when compared to open wire feeders. Because losses increase as the mismatch on the line termination increase, mainly in heating losses, the type of line chosen to feed the antenna is very important to us. Also, the frequency at which the antenna is perfectly matched (if it is matched at all) will be in your favourite portion of the band in use. However, if other parts of the band are to be used an increase in mismatch, proportional to the deviation from design frequency, must be expected. If a multiband antenna is used without being carefully matched for each band used, then the mismatch on the various bands will be substantial. This is pretty obvious.

If the transmission line has *very low loss characteristics* then high standing wave ratios can be tolerated with no practical loss of power in the antenna system.

> "A wire antenna, fed at the centre with open wire line is the most efficient multiband antenna devised to date. For all practical purposes the feedline is loss-less so extremely high SWRs can be tolerated. This does not mean that coaxial cable cannot be used, because of high SWR, but only the very best and expensive types are really suitable in this application."
>
> (*ARRL Handbook* 1978, page 584)

The feedpoint mismatch, although affected to some degree by the immediate environment of the antenna, does not effect the gain or radiation characteristics of the antenna. High SWR in an open wire line at HF caused by a severe mismatch **will not** produce antenna currents on the line, **nor** cause the **line to radiate,** if the feedline currents in each wire are **balanced** and if the spacing between wires making up the feeder are small at the wavelength of operation. (Maxwell, *QST* June 1973, page 22).

By comparison, coaxial line has higher RF losses than open wire line at HF chiefly because of its lower impedance causing higher current flow at lower voltage for the same power. For a given coaxial cable feeder the shorter it is, the less loss is to be added for a given SWR. (Maxwell, *QST* June 1973, page 21). The author is not attempting to advocate the use of open wire line coaxial line per se. At HF, for **moderate** lengths of low loss coaxial (low attenuation) cable loss is negligible even with an SWR of 5:1. So, even with high SWR figures, there need be no loss of any power if the antenna system is carefully thought out. That is, what length of feeder run do you need, what SWR figures can you reasonably expect, what range of frequencies is the antenna likely to be exposed to, and what type of feeder (balanced or unbalanced) does the antenna require? In many cases, the open wire feeder has a lot of advantages when compared to coaxial cable.

CONJUGATE MATCHING

Is the power re-reflected from the antenna because of high SWR lost? In a transmitting antenna the reflected power can be re-radiated, together with the forward power, by use of a transmatch or other antenna matching unit. This process is known as conjugate matching. Maxwell described this process extensively in *QST* October 1973. The Bibliography lists all articles in this series and they also are strongly recommended reading. Conjugate matching is the result of precise and total re-reflection of the

arriving reflected wave to the antenna from the antenna matching unit. This means that reflected power is **not** lost when an antenna matching unit is used. It is reflected, with the forward power, to be re-transmitted as full power, by the antenna. (Maxwell, *QST* October 1973).

So, even with high SWR figures, there need be no loss of any power if the antenna system is tuned to the impedance required by the transmitter with the use of an antenna matching unit. Further, there is no reason why open wire line cannot be used if long feeder runs or cost, etc, precludes the use of coaxial cable. In fact, it is preferable to coaxial cable under these circumstances. But to feed the unbalanced transmitter (50 ohm) to balanced open wire, ladder line or television ribbon (600, 450, 300 ohm) line to the antenna, a balanced antenna matching unit is best utilised for the reasons discussed.

Now, looking at some more aspects of antenna systems amateurs consider; not everyone can, nor needs to have, a huge tower with directional arrays. It is not practical, nor necessary in many cases. It is entirely economical, efficient and sensible to use a dipole doublet, on bands from 3.5 to 28 MHz, where the individual amateur's circumstances dictate. The question is, of course, how to feed it to operate most effectively over this range of frequencies because of the varying impedances. For many amateurs, a G5RV doublet with 300 ohm ribbon and then coaxial cable to the transmitter is one solution. The author's G5RV uses ladder line from the centre insulator right down inside the shack to a balanced output antenna matcher; a 'Z' matcher in fact.

If the amateur does use beams then problems arise in choosing feeder types. In some cases, including the author's, the antenna tower may be 500 feet or more from the transmitter. Beams on rotatable masts are more conveniently fed with coaxial cable for obvious reasons. However, coaxial cable can have some horrible attenuation figures over a 500 feet run, not to mention horrible dollar figures too. The author found it convenient to use open wire feeder from the shack to the antennas. Experience has shown that, in the case of the G5RV antenna used at VK5LB, open wire line in the shack, coupled to a balanced antenna matching unit used by the author, there is no RF floating around in the shack. There is no TVI or BCI caused by the use of open wire line. The author also has a computer and television monitor in the shack. Tests reveal that the only interference occurs when the open wire line is **physically touching** the television coaxial line and **in no other circumstances.** If the television coax from either the computer or the television antenna is moved a foot away from the open wire line then any trace of interference to the television ceases completely. Open wire line in a shack will cause no problems if correct construction practices and line layout are followed.

The open wire line at VK5LB is simply laid out in the same way as coaxial cable.

COAXIAL BALUNS

For open wire line to be used to feed rotatable beams a halfwave section of coaxial cable may be used. (Remember it repeats the impedance of the antenna at the end of the section. *ARRL Antenna Book,* page 127). A coaxial balun will convert the line to a balanced feed of either 1:1 or 4:1 ratio depending on the construction of the balun.

Advantage of coaxial baluns are that they are capable of handling the specified voltage of the cable from which they are constructed and they are frequency sensitive. They respond only to the frequency for which they are cut and attenuate others. So, as well as feeding a multiband dipole open wire line is simple and easily used to feed baluns as well.

Debate as to whether construction of open wire line is simple or easy is an entirely different manner. Personal experience has shown no special difficulties but there are many who disagree. The point is that there is no real bar to using open wire line and it is much cheaper over long feeder runs. It is a practical alternative to coaxial cable where the coaxial cable use poses problems of one sort or another.

The author has mentioned balanced antenna matching units and, in particular, the 'Z' matcher used at VK5LB. There are differing types of balanced matching units suitable for use with open wire feeder described in most text books. Almost all of them either are directly coupled electrically between the input and output, or require coils to be changed or taps switched with a change in frequency. In most cases, the coils require taps on the outputs as, with many antennas of differing impedances, the amount of inductance required differs. The coils must be kept symmetrical and so care must be used in the positioning of the taps. (*ARRL Antenna Book* 1977, page 101). This also applies to switched tap coils. (*ARRL Handbook 1982, page 19-13).*

The 'Z' matcher, by contrast, has no tapped or switched coils. It utilises two coils, one within the other but not electrically connected. One set of coils is for 10 to 20 metres and another is for 40 and 80 metres. The outputs are taken directly from the ends of one of each of the coils. There is no problems therefore with line balance or unequal currents in the feeder line legs. Also, the 'Z' matcher has only two controls (capacitors) for impedance matching and so is very simple to construct and adjust.

The author intends to write an article in the near future describing the 'Z' matcher in detail with photographs and a circuit diagram. Many amateurs may wish to construct a similar unit.

The author has attempted to point out a few pertinent facts, as opposed to fallacies and misconceptions, concerning the use of equipment other than the usual coaxial cable and transmatch which are readily available commercially.

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ar

Why doesn't your company advertise in *Amateur Radio?*

RAYNET WANTS PHONE PATCH

The Raynet organisation in Britain says it is quite jealous and envious of the third party and phone patch privileges available in the USA.

Raynet if the British equivalent to the Wireless Institute Civil Emergency Network (WICEN).

Raynet chairman, Geoff Griffiths G3STG, said that until recently it had been difficult to get third party traffic defined in the UK. "Up until the Mexico earthquake disaster, the government in Britain really tolerated the radio amateur and didn't understand the tremendous value of the communication resource the radio amateur was able to offer," Geoff said.

He made those comments in an interview broadcast in the United States by the Radio Amateur Information Network (RAIN).

The turning point was the Mexico City disaster in September 1985, Geoff said.

The British Government had apparently been put off the prospect of the Amateur Radio Service providing worthwhile communications because it had lumped the radio amateur along with the worst of the CB operators.

"But, when Mexico happened they discovered that radio amateurs were able to help our own Foreign Office so much by providing a link through the International Amateur Radio Network (IARN) with communications to Mexico City.

"They suddenly woke to the fact that radio communications provided by the volunteer agencies could be of tremendous help to them.

"Their attitude, their co-operation level has been increased by leaps and bounds ever since then," Geoff said.

The Australian Traffic Net (ATN) also used the IARN during the Mexico disaster to pass third party traffic messages. The IARN is managed by Glenn Baxter K1MAN, in Maine, USA.

Raynet chairman, Geoff Griffiths said he would like to see phone patch in the UK. But, he would only be in favour of phone patch for emergency communications, and for it to be available under very controlled conditions.

The British radio amateur faced the same opposition experienced in Australia with a government-owned communications monopoly (Telecom) opposing phone patch. It took years of careful and consistent approaches to Telecom Australia to gain phone patch for the Amateur Radio Service.

Raynet however, wants to see phone patch only available for its members. Geoff said he believed that, to give all radio amateurs phone patch in Britain could bring disrupt to the Amateur Radio Service in that country.

"What I would like to see is a whole range of special privileges or licence conditions granted to Raynet members," he said.

But, the British Government was reluctant to give Raynet special conditions.

"So, winning privileges (phone patch) which are regarded (in the US) as an every day tool for emergency communications is really quite difficult," Geoff told RAIN.

YOUTH OF YESTERYEAR

The youngster of today has a new toy. He begins with the crudest of materials, and at very little cost, builds himself a radio set.

He explains what he is doing in fluent jargon, which makes his father think desperately of a dictionary.

A walk around the great wireless show in the Exhibition Building is sufficient to show that the greater number of radio enthusiasts are boys — or were not so long ago.

—From the *Sun News-pictorial,* Special Radio Supplement, March 9, 1927.

How's DX?

THE WILGA TREE

An embroidered account of a DXpedition. Fictitious names have been used to protect the guilty, however the main points are true.

. . . calling CQ CQ CQ QRZ. Yes well cheers Des, nice to catch with you again.

Yes, wasn't a bad trip, we got a few contacts in ZL-land, but most were around VK4 and VK2.

How many? Well, I suppose about 15 or 20. I'll tell you how we did it, if you want to try it yourself sometime.

First Des, you have to make sure that your car battery is about three years old. You can't trust a new one these days. Now get one of those beaut noise filters from the shop down the road, you know, the ones with the little choke in them rated about three amps. You know the ones?

They work a treat on sideband. Put it somewhere in the car, and arrange your mobile rig to plug into it. Hook the filter up to the battery. Some wire from an old three-core flex will do.

If the car is fairly small, you won't have to spend too much money on petrol. It's nice if it's got a parcel shelf under the dashboard too, and a good high console between the front seats. There is no point in hanging the HF rig from the dashboard anyway, you'll only bump your leg on it, or your head when the fuses start blowing. If you put the rig on the back seat, it will be out of the way, and it can have a good long power lead from the filter to it.

What did you say about mobile aerials? Well, if you've got a fairly small car you won't have to carry one of those five metre long whips because it won't fit. They clutter things up too much anyway. We got out on a re-wound 11 metre one. It was about two metres long. Really compact. It had a telescopic whip at the tip to adjust the SWR, and it was good for nearly 15 kHz without adjusting.

I thought you meant mobile antennas. Well, we took a dipole as well. You should have seen the coax. Ours had at least three joins in it with PL-259 plugs and joiners, we didn't bother about a balun. We did the right thing and set it up by daylight. There's no point in testing the thing before you go away because with all the other houses and antennas around you can't get the same results in the bush.

We used a tree to throw the halyard over. We picked the highest one around for three or four kilometres, it must have been nearly four metres tall, and if you stood on the ant hill near the bottom you could get about 10 centimetres start on your throw. The ants weren't too keen on the idea though.

Yes, the swelling has just about gone down and I can put shoes on now. I threw the halyard over the top with a spanner tied to it. If I tugged the rope gently I could get the spanner back without bringing down too much of the top branches. When I'd had a bit of a try at this I picked a lower branch with fewer leaves on it. After the third try it went over without getting the line caught in the bark.

Oh, by the way, don't believe all those stories about how good "Rid-o-gard" is. I tell you what, there were still flies in the car the next morning. Bill's sandy blight is just about gone now. You should have heard him the other day when he thought he'd gone blind overnight!

Well by then things were beginning to look alright. Bill plugged the coax into the antenna and rig and took a reading on the meter. The SWR was hard over in the red. We, he reckoned that was a bit funny so he tuned down to the bottom of the band, and then the top. Got the same thing again. Both times! He had a bit of a panic, and I said to get the multimeter out of the boot. We dug around a bit, and came up with it about as good as new, considering. We checked the whole system and, you guessed it — about one ohm resistance.

I tell you mate. I sat down in the car to reflect on matters. Bill went on a bit about life and the universe in general, and PL-259s in particular. After a while we decided to pull the antenna down and put the multimeter on it. Guess what? The coax was okay but the antenna was no good.

You're telling me Des. Bill had a 259 on the antenna and he reckoned that the heat when he soldered it up the other day must have melted through the inner insulation. I got a pair of wire cutters and cut it off. We cut the other one off as well and separated out the coax core and braid for about 50 millimetres. Bill had a 12 volt soldering iron in the boot so we plugged it in, dragged the antenna over and soldered the braid and core on. The iron would have been about big enough to put an IC into a circuit board. Well, we eventually got enough solder on it. Dragged the antenna back to the tree, put it up and got the rig going.

Oh well, when we tuned up this time, we couldn't even get enough power out of the rig to get a reading on the built-in meter. "Start the motor," says Bill; "a few more volts might help." Well, the SWR was 8:1/ We tried both ends of the band and it looked better at the top end. "Too long," I said, so we cut a good 300 millimetres off each end. Tried again, still the same! "Still too long," said Bill, so we cut a bit more off. It wasn't hard to do. The actual problem was to keep the ends from dragging on the ground. One end was tied to a rock, and propped up with a piece of PVC pipe Bill had found on the side of the road. The other was on the barbed wire fence beside the tree.

No, not directly. There was a couple of metres of nylon rope on it. By this time we were sick of cutting the antenna, so we just bent some of it back, and wrapped it around itself. The SWR was still 8:1 across the band, but a little better at the high end.

Well, nothing we did made any difference to it, Des. I got hold of the multimeter and checked the coax at the rig end. It was open circuit, like it should have been, even with the meter on the high resistance setting. I got Bill to put his finger across the coax inner and braid at the rig end and we got about 2 Mohms like you'd expect. By this time Bill had had about enough. So had I. If there was a chaff cutter handy the whole lot would have gone through!

At least the flies were beginning to pack it in by then. Actually the sun was going down so we reckoned we'd knock off too. We pulled the whole lot down, rolled it up, and went back to town.

Next time Des? I'll tell you what, next time. It's going to be an end fed wire with a great big ATU on it. No dipoles. They just don't work on wilga bushes.

—Contributed by Ken England VK4JPE

The Saharan Arab Democratic Republic or RASD — formerly Spanish Western Sahara — was formally proclaimed on February 27, 1976, in Bir Lehlou. To date, the RASD has been recognised by 70 countries and is the 51st member of the Organization of African Unity (OAU). The country is bordered by Morocco, Mauritania and Algeria. The physical character of the area ranges from vast stretches of desert to green oasis, from worthless sand to valuable phosphate deposits.

The first Saharaui operator, Naama Zeine-Eddine S01A, is now fully trained and will be further developing the Union de Radioaficionados Saharauis, S0RASD. QSL manager for the club station is EA2JG, Arseli Etxeguren, 81 Las Vegas 01479 Luyando-Alava.

—Contributed by George Cranby VK3GI

SPECIAL EVENT STATION

A special event station, GB2LNM, will be operating between September 24, 1988 and October 24, 1988, on all amateur bands.

The station letters stand for Great Britain Loch Ness Monster.

—Contributed by Danny GM4LDU via Lee Noonan VK2LEE

QSL card from Rio de Oro, S0RASD.

FROM WOODBINE

June was a rather poor month for activity from Woodbine due to absences and preoccupation with family matters. On June 19, conditions were excellent on 20 metres to the USA with strong signals being reported.

Bob W3MIE/K3HWL was worked operating a special station from Meadville, Pennsylvania, in celebration of Meadville's 200th birthday. It is believed an attractive QSL card has been struck for this occasion and is available from the QSL Manager, N3EWP, either direct or via the bureau.

WA5MOA, in Texas was a very strong station, but no contact was made.

A very enjoyable QSO with Charles KA2WHU, lasted about 30 minutes.

Another interesting QSO was on 20 metres with Paulo PY1FB/MM, June 9, near Norfolk Island. Reports were 5 and 9 both ways. QSL via bureau.

Other contacts were as follows. All are on 20 metres unless stated otherwise.

June 6 WY5L/KH3 (QSL via N5DAS)
June 10 RB0GG (QSL via bureau)
June 19 KA2WHU (QSL via bureau)
June 25 FK8KAB/P (QSL via K8 bureau); VE2BYR; FD1NCK/F0 (heard only); NL7MY; NL7NF; VK6APW
June 26 VK2NNK (on 10 metres); FO4NP (heard only)

—Contributed by Bob Demkiw VK2ENU

MALYJ VYSOTSKIJ ISLAND 4J1FS (Finnish/Soviet)

Yes, the joint Finnish/Soviet DXpedition, by all reports, was a complete success. It appears that they only operated on the 20-metre band, but reports at the time of going to press are rather sketchy. It is unfortunate that such an operation from what was heard in VK, that the out of band stations, remarks, the self appointed 'policemen' and general behaviour of some amateurs was inexcusable and not good for amateur relations between any countries.

Nevertheless, the question still remains, will this island become a new DXCC Country and Bob Winn W5KVE in his magnificent weekly newsletter quotes the following 'statement' which is reprinted from the ARRL Letter.

In what has been probably the hottest DX news since Peter 1 Island and the Western Sahara, along comes Malyj Vysotskij Island claimed to be a new DXCC country.

MV Island is located in the bay of Vyborg in the Western USSR at 60 degrees 17 minutes North latitude and 28 degrees 34 minutes East longitude. This uninhabited island is about one and a half kilometres long with its location of some strategic importance. It is apparently leased to Finland by the Soviet Union and is separated from Finland by intervening Soviet Islands and continental land mass.

It seems that the potential DXCC status of this island was proclaimed some 17 years ago by the Assistant Communications Manager R L White, acting at the direction of the ARRL Awards Committee: 'At such time as operation takes place. . .we will make an official announcement of its addition to our Countries List. This long forgotten action has been sitting untapped for all these years, since permission to activate the island could not be secured from the authorities.

Martii OH2BH, a genius at diplomacy, dedicated DXer and a valued assistant to amateurs in countries that want to share our hobby, has forwarded copies of the original documentation, dated November 17, 1970.

It is highly technical and has created immense precedents that we will have to live with in the future, so please it is a positive action that deserves positive thinking and there is no one more capable to handle it than John Parrot W4FRU, Chairman of the ARRL DX Advisory Committee, his Committee and Don Search, Manager of the DXCC ARRL Awards.

Congratulations Martii and all your helpers, with a big thank you, from DXers world-wide for your approach, that may allow us a new DXCC Country. If so, it will add another to my score and many other VKs too.

—Adapted from *QRZ DX* by Ken McLachlan VK3AH

When inquiring about products you have seen in AR, don't forget to mention where you learned of the product!

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ONE VALVE REGENERATIVE RECEIVER

Peter Parker VK6BWI
C/- Witchcliffe Post Office, WA. 6286

This receiver was based on one published in* Electronics Australia, *March 1966. It is very sensitive and much superior in all aspects to the receiver described by the author in January 1988 AR.

WITH GOOD SIGNALS it will provide good speaker reception in a very quiet room, if you are using a reasonable outdoor aerial, such as a G5RV. Aerial coupling has been kept low so that aerials can be changed without a large change in the tuned frequency.

The receiver can be bumped and turned off with very little detuning. This was due to the fact that the prototype was built in a diecast box with a ceramic valve socket, all of which were salvaged from an old valve FM broadcast receiver. Such over-designing is not necessary for good results, but a metal enclosure helps.

A mistake sometimes made is to connect pin five to earth and pin four to 6.3 volts. This is correct for nine pin valves with a number beginning with six, but not with these valves. Simply connect pins four and five together to 6.3 volts and pin nine to earth.

The 50 pF variable capacitor could be increased to 100 pF with no ill effects and a 100 pF unit will be more convenient. A 50 pF unit can be bought for about $8. For the tuning capacitor, any one from an old valve receiver will work but the tuning ranges will vary.

The unit uses 1.5 mA of HT.

After winding the coil, test it and turn the 50 pF variable capacitor to maximum capacity. If nothing is heard, put a 47 to 100 pF styroseal or ceramic (note voltage ratings) in parallel with the regeneration capacitor. Always turn off the HT and wait before working on equipment. I always disconnect the HT.

If there is still no oscillation or noise, reverse the regeneration coil and repeat the above steps.

Construction was with tag strips. Remember to keep 6.3 volts low tension hum from interfering with reception.

To give you an idea of this set's sensitivity, 80 metres SSB signals were just audible with 20 centimetres of wire as an antenna. With the normal aerial, many coastal stations from interstate provided strong reception. This receiver, like all regenerative sets, has a shortcoming of poor strong signal handling due to a non-linear detector.

(For a list of coastal stations, see AR, June 1986).

As for the choice of valves, a 12AX7 is markedly superior to the 12AU7, but the 12AU7 is still a satisfactory performer. I expect the 12AT7 should work, but I have not tried one. The original 1966 article used a 6SL7 which is claimed to be as good as the 12AX7.

(Much more output could be obtained if the 100 k resistor to the output plate, pin 1, were reduced to 10 k. Better still, connect the output transformer primary from HT+ to plate, deleting the 0.022 capacitor. Of course, the set will then draw much more HT current, about 10 mA with the 12AU7. The 12AX7 will need a lower cathode resistor, say 270 ohms. —Technical Editor)

See page 31 for Figure 1.

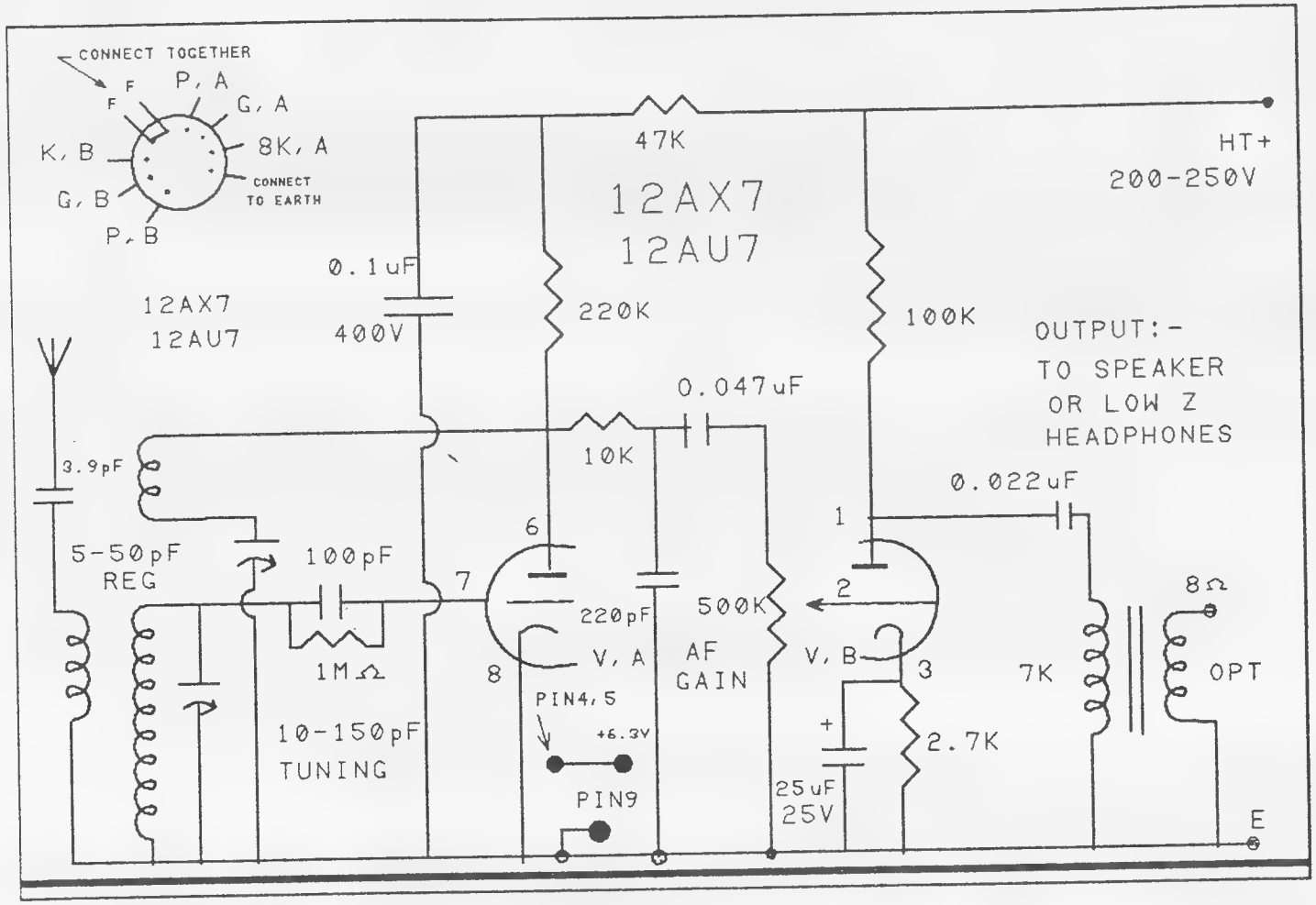


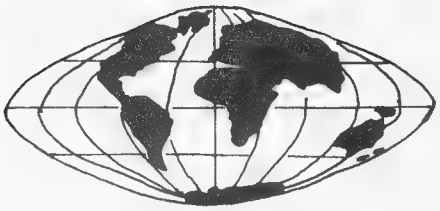
Figure 1: Circuit Diagram.
Coil for 3 to 5 MHz.
Former about 35 millimetres in diameter
Wire Gauge approximately 0.8 millimetres

Coils are wound over each other and separated by tape. Order is probably unimportant

Aerial Coupling — 9 turns
Regeneration — 12 turns
Tuning Coil — 29 turns

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

VHF UHF — an expanding world



All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.005	ZS2SIX	*South Africa*
50.011	JA2IGY	*Mie*
50.020	JE6ZIH	*Japan*
50.028	JA7ZMA	*Fukushima City*
50.066	VK6RPH	*Perth*[1]
50.075	VS6SIX	*Hong Kong*
50.080	KH6JJK	*Hawaii*
50.110	BY4AA	*China*[2]
51.020	ZL1UHF	*Auckland*
52.013	P29BPL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.440	VK4RSD	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*Macleod*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.440	VK4RSD	*Brisbane*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
2304.445	VK4RIK	*Cairns*
2306.440	VK4RSD	*Brisbane*
10445.000	VK4RIK	*Cairns*

1. Approval has been given for this new beacon, VK6RPH on 50.066 MHz, to commence operating from Perth as from September 1988. For the first time in Australia we will have an opportunity to compare the relative propagation properties between 50 and 52 MHz. For this reason, I hope the planning has been such that the two signals will be comparable when they leave the antenna, otherwise the exercise will not be nearly as valuable. The message came from VK6KXW via VK5NY.
2. BY4AA has been active on 50.110 MHz beaming towards Australia between 0300 and 0900 UTC.

The June 1988 issue of *The Western Australian VHF Group Bulletin* gives a new and full listing of beacons in Western Australia. In this it is stated that VK6RTU on 52.350 MHz is temporarily out of service and no mention is made of VK6RPB, on 144.565 MHz at Port Hedland. Both of these have now been removed from the above list.

Other beacon news included in the Bulletin is that of BY4AA mentioned above, also SZ2DH has been active on 50.015 MHz from Athens, Greece. It is operated by SV1DH.

Also, 9N88ITU in Nepal, has been operating a beacon on 52.125 MHz and listening on 52.145 MHz for any calls.

I notice that the Hamilton six metre beacon, VK3RMV, has been missing for the last few days. As it is always audible at Meningie I am hoping the interruption is temporary.

With the receipt of the above information from Western Australia, I feel reasonably safe in saying the beacon list is now accurate except for VK5RSE at Mount Gambier, which has been giving some temporary trouble but should be cured by the time you read these notes. My thanks to those operators who have forwarded information regarding the status of the beacons in which they are interested. Those other publications which use this list are assured of its general accuracy and are requested to please acknowledge the source when reprinting!

TWO METRES

I was pleased to receive a letter from David Tanner VK3AUU, with an update of his recent two metre activity. With an extremely good equipment set-up and antenna farm, he is currently to the forefront of activity in Victoria.

David reports: "The EME log is starting to get a few entries now. I have worked 22 stations in 12 countries including a two-way SSB contact with HB9CRQ on June 11. I have worked W5UN a total of 15 times with the best contact back in January, when I was using 60 watts to a single 19 element Yagi. I am pleased to note my article on the DL6WU Yagi has prompted the construction of quite a few of these around the country with most being very happy with the results.

"W5UN now has 48 Yagis with a calculated gain of 30 dBd so anyone with 100 watts and one long Yagi should be able to work him.

"The station here now consists of four DL6WU 19 element Yagis stacked 15 feet wide and 13.5 feet high. I estimate the antenna gain at close to 21 dBd less feedline loss. The phasing lines are heavy 300 ohm ribbon and the rest of the feedline is a mixture of half-inch heliax and 10DFB with total loss of about 1.5 dB. My 8877 amplifier is capable of putting out 1800 watts on CW so the ERP is about 160 kW. (I do have a high power permit). The preamplifier is a MGF1302 with noise figure of 0.5 dB. On moon-set to the south-west I can detect echoes with 50 watts leaving the shack, while up in the air the best I can hear is about 400 watts of CW and full bore SSB. Plans are afoot to increase the antenna to a maximum of eight Yagis in the next couple of years. Anyone who is contemplating such a structure should be made aware of the potential wind loading of around 400 kilograms at wind speed of 140 km/h and design the supporting structure accordingly!

"On the terrestrial scene I seem to be able to work VK2ZAB any time on SSB with his signals eight to 10 dB above the noise. This is a distance of 680 kilometres across the highest mountains in Australia, not exactly line-of-site.

"The following interstate stations were worked in May and June. VK1s BG, BUC, GL, VP, RK, VK2s MQ, DVZ, KWA, KYP, ZAB, ZRE, VK5s ACY, OH, LP, DK, NY, KCX, ZMK, ZDR, VK7s JG, AV. Of these the most difficult was VK2MQ, at Tumut.

"Good tropospheric conditions were noted on the following days:
May 10, 11, 12, 29, 30, 31. June 2, 3, 4, 24, 25, 26."

Thanks for the letter David. I hope your location is not subject to some of the winds we have here in South Australia. Roger VK5NY, suffered a bent mast recently with two eight-element six-metre Yagis. When living at Forreston, I too, suffered the same fate with the same antenna system in a 140 km/h gust. Here at Meningie I worry about my antenna installations at times, although I have less up-top these days and the 25-foot boom six-metre Yagi is mounted just above the top of the tower which is some help in reducing final top-loading.

The *West Australian VHF Group Bulletin* for June said that "Bob VK6ZFY and Bob VK6KRC, both located in Perth, heard FM signals recently just below 144.100 MHz. The speech and accents indicated the source could be Indonesian fishing boats operating off the West Australian coast or even in Indonesian waters. The signals were heard around 0700 local time on an exceptionally warm morning."

Given that the distance to Indonesian waters is around 3000 kilometres from Perth and much of it over the Indian Ocean, the signals may have been coming from anywhere in between or the full distance under favourable conditions. As amateur SSB and FM equipment is cheaper than commercial or marine equipment, it is more than likely many boats in a fishing fleet would have such equipment and possibly using it illegally. Most times we would not hear it. The way amateur equipment is used by fishing fleets on the HF bands is well-known, it is inevitable that it will be used on VHF.

While we are still on two metres, a letter has arrived from ,my long term friend Ross VK2ZRU, in Sydney, with a comment on my recent reference to Phillip FK1TS, hoping to work back to Australia on two-metres.

Ross says: "Two-metre contacts to New Caledonia have been achieved quite often from eastern Australia but only with very solid Es propagation. Unfortunately, Noumea is too far north from us to get into ducting from very strong and slow moving highs across the Tasman. Such signals are a summer time phenomenon, not getting very far north in the winter months, as they do in VK5 on a line roughly through VK7.

"Some of the openings to FK have brought some interesting contacts. Copies of QSLs enclosed show one from FK1RF who was in a car using a five-eighth wave vertical and 25 watts. Also, FK8EM. I was his sixth VK contact that day!

"We can thank OSCAR-10 for this activity. Up until that satellite came on the scene Noumea had really only been working on six-metres and didn't need two-metre and 70 centimetre equipment before that time."

Thank you Ross. I am sure Phillip will be encouraged to read that information. I was aware such contacts had been made and it should have been mentioned at the time.

Other contacts made by Ross include FKs 8CR, 8AH and 1SB, the latter running 150 watts to two 10-element Yagis. Most contacts seem to have been made during the morning from around 0000 to 0300 UTC, although the contact with FK1SB was at 1205.

FROM SOUTH AFRICA

The June 1988 issue of *VHF News* from Hal Lund ZS6WB, reports further TEP contacts on six-metres between ZS3AT and 9H1FL (Malta) at 1540 on 4/5, and on 8/5 between 1630 and 1645 UTC, QSOs with FC1GTU, FC1GXV (Corsica) and CT4KQ (Portugal) with the latter peaking to S9 for more than an hour.

In the same issue is a reprint from JA1VOK in *Five Nine* of DX conditions in Japan. From 4/4 to 3/5, six-metres was open every day. Countries QSOed on six from JA during this period included 3D2, 5W1, FK, FO0, FW, H44, HL9, KG6, KH0, P29, T20, T5, VK2, 4, 6, 8, VK9N, VS6, YC, XX, ZL1, 2, 3. The VK8VF two-metre beacon was heard in JA on April 9, 13, 15, 16, 17, 19, 24, and May 2. Contacts were made between JA and VK8 on April 15, 16, 17, 19 and May 2 on two-metres.

Hal ZS6WB, makes the comment in regard to the above that the JA to northern Australia TEP path is similar to their path from Windhoek to southern Europe, the main difference being in the number of station active at both ends. Those further south in South Africa therefore have much in common with VK1, 3, 5 and 7 who missed our on the openings.

What should be of considerable interest to VK operators from the list of contacts is the wide field over which six metre activity is currently spread. Whereas for the last cycle, in some cases, operators had to finally get moving and start operating part way through the cycle, this time they are ready and waiting. With suitable vigilance on our part, many exotic contacts will become available over the next five years or so, particularly as more countries are now aware of some of out operating restrictions and the need for attention to the 52 MHz segment.

THE BIRCHIP STORY

Ray Naughton VK3ATN, from Birchip, well-known for his early exploits into EME from a very large antenna farm, is now looking to attempt something different. Information received mentions the construction of a huge rhombic antenna system suitable for use on 28, 50, 144 and 432 MHz. The antennas will be mounted on aluminium towers 108 feet high and each leg of the antennas will be 440 feet long.

Two rhombics at 108 and 82 feet can have their parameters physically changed to provide operation on either 28 or 50 MHz with a gain of 28.5 and 31.9 dBi respectively. Four other rhombics will be mounted at 60, 54, 48 and 42 feet to provide a gain of 38.6 dBi on 144 MHz. Four others will be mounted at 36, 34, 32 and 30 feet to provide a gain of 43.3 dBi for 432 MHz. By suitable adjustment it is considered the system could be used on 14 MHz with a gain of 25.5 dBi and on 7 MHz with 22.5 dBi. All the vertical angles, declination and Greenwich Hour Angles have been calculated, together with the width and length requirements.

The main lobe will be centred on 68 degrees true north and this beam heading centres approximately on Kansas, USA. Maybe a warning should be sent to Gordon VK2ZAB, that this direction will be very close to directly over him. The many kilowatts of ERP will surely have an effect on his sensitive equipment! VK5LP, for one, will be very interested, eventually, to see how Gordon does receive the signals on the four bands nominated. The rear of the system will be pointing fairly close to Naracoorte in the south-east of South Australia, so VHF operators there may hear some strong signals.

Ray says he has hopes that, in time, the system could be made available to mobile or portable operators, who could drive up to the antennas, connect their equipment and sample EME operating. There will be no charges for connecting to the system, but any donations towards the project, at the time will be accepted. It is hoped to have the 28 and 50 MHz systems operational by the end of 1988, with 100 watts being fed into the antennas.

The whole thing is a huge project. For the time and money already spent we can only hope the idea works and is therefore worthwhile. We also hope Ray will not be climbing any of his towers when the wind is blowing strongly! Good luck.

GEELONG AMATEUR RADIO CLUB

The Geelong Amateur Radio Club Newsletter told me the Club celebrated its 40th birthday with an anniversary dinner held at the East Geelong Golf Club on June 18. Together with my readers, I offer the Club congratulations for achieving such a milestone and hope it will continue to prosper and be of value to the amateur fraternity.

I am sure that much of the reminiscing which took place centred around the technological advances which have been made since the Club was formed in 1948.

As an historian dating back many years, now with six history books to my credit, the last being launched on July 7 and another to be launched next year, I can only urge the Geelong Club and any other organisations with an historical background, to try and have that information recorded in written form. It is so easy to leave it till later, but later is often too late. Do it now!

WINTER-TIME SPORADIC E

Throughout June there were spasmodic openings on 144 and 432 MHz from VK5 to VK3 in the lead-up to what could be seen as the annual winter Es openings. These commenced on 24/6 when a large rather stationary high pressure system produced excellent signals into Melbourne and some Victorian country districts. Roger VK5NY, from Mount Wilson was having a ball with very strong signals on both bands to Melbourne and also from VK3PM, in Mildura. None of the signals were nearly as strong at Meningie although they were workable. Peter VK3PM, was using a vertically polarised antenna which was not helping, but Roger was receiving him better by up to three points than was VK5LP. The unusual circumstances also prevailed on 432 where signals to me from Melbourne were poor.

The next day, 25/6, the signals were certainly better. At 0015 UTC, VK5LP worked VK3AMZ 5x6, 0019 VK3NM 5x6, later at 1126 VK3DHW 5x8 and 1129 VK3ZJC 5x7. However, there was still no joy on 432 MHz. Roger VK5NY, continued to work all and sundry with great signals and caused much frustration by working VK2YEZ at Griffith at 1237 UTC 5x9 on 144 and 5x5 on 432! The good conditions continued through 26/6.

On 28/6 six-metres opened to VK2 when VK5NY worked VK2XJ.

The band quietened down somewhat until the next high pressure system came along on 11/7. Of course, this had to be the time when VK5LP was absent for a week at a conference in the old hometown! The following is a report of the activity as passed on by Roger VK5NY.

11/7: VK2YEZ at 1123 on 144 and 432. Also VK2KAW and VK2ZMP at Wagga. VK3KUB and many other VKs. Heard the Canberra beacon VK1RCC on 144.410 MHz at 1227 very strongly but no other signals from that direction.

12/7: VK1RCC beacon in most of the day around S2. At 0452, on six-metres worked VK7ZIF at 5x9, soon after worked VK6JXX at Esperance. His signals were reasonable considering the use of a quarter wave whip at his end! Then worked Peter VK6KXW, in Perth and was advised of the new beacon to come on 50.066 MHz. Peter said he had been monitoring a lot of television stations from the east during the day. He had also been hearing a number of signals around 48 and 49 MHz from Asia.

13/7: The day dawned with good signals still prevailing, particularly on two-metres. VK2BY at Broken Hill was working via the Mount William repeater. Roger asked him to QSY to the low end and promptly worked him at 0017. At 0101 heard VK1RCC and again at 0123, also for some time thereafter. At 0210 the Melbourne beacons VK3RTG and VK3RCW were both copied with QSB. The band appeared to be wide open to Wagga and on through to the Blue Mountains but there were no signals to work! On checking with Roger around 1100 the conditions had disappeared with the high pressure system dissipating. No beacons were audible at Meningie and the Mount William repeater was inaudible. The Mount Gambier beacon was still missing.

Roger VK5NY, summed up this burst of winter Es and tropo by saying that he had never before experienced the reception of VK1RCC for three days in succession. In addition, VK2XJ had been worked again at 0528 on 13/7 which made him available each day for a week on six-metres. Roger had also noted hearing the ZL beacon on 28 MHz an hour or two before the VK2 beacon and this was a pointer to the approach of some possible good six metre conditions.

SOAP-BOX

For some time now I have been wanting to write a few paragraphs relating to VHF propagation, in response to requests I receive from time to time, mostly from new operators, who are not sure how to get the best from the three most populated bands, 52, 144 and 432 MHz. In particular, 50 to 52 MHz because of its capabilities of supporting fairly regular long distance communications.

Until this month, my columns seem to have been very full, but for some reason, this time there is a reduction in news. As it is September and the month when it is possible there may be an increase in six metre DX activity, the time to say something seems appropriate.

I am not going to make what I say seem like a primer for working other stations with extended reasons why some happenings occur. There are many good publications by recognised authors dealing with the subject in detail. It will be more useful to say what can occur and when may be the best time to observe the phenomena — the question most asked is — *what must I do to work a DX station and when do I start?*

THE SYSTEM

For the moment we will deal with the six metre band, the other two being referred to as necessary. Without seeming to say the obvious, there are some minimum requirements in regard to equipment. One does not need a transceiver but it helps! All operating today is by the two stations involved being on the same frequency, except in certain split frequency operations which can be deferred for the moment. In the former days of AM operating it was not uncommon to transmit on one frequency and receive on another. Today, a transceiver or transverter will allow single frequency operation. Equally as important is a reasonable antenna, say four elements or more fed with the best feedline you can afford. Coaxial cable may help you to keep out of your neighbour's television set, particularly if you can't get your antenna up very high. A rotator which can be operated from the shack will make life easier when it comes to peaking up the signal of the distant station.

OPERATING

One prime requirement is to transmit! Not many contacts eventuate if everyone is listening. There are certain designated call frequencies for SSB,

52.050, 144.100 and 432.100 MHz. A world-wide DX calling frequency exists on 50.110, but this is subject to certain restrictions in Australia, depending in which State you live. Normal operating is permitted in VK6 and VK8, all other areas have power restrictions and those with Channel 0 stations, time restrictions as well. Refer to the DOTC Operating Manual or former issues of AR for details.

When using the call frequencies and a contact is made, unless the contact is of a very brief nature, it is courteous to move off the call frequency to continue the contact. When calling, announce your call sign frequently. Many operators will call "CQ DX" up to 10 times before announcing their call sign, perhaps twice! The operator at the other end having heard you say "CQ DX" once is more interested in your call sign which may not be so readily decipherable. Use recognised phonetics as laid down in international standards. The Japanese are notorious for using all manner of strange phonetics which slows down recognition and thus the contact rate. There are some Australian operators who have used odd phonetics for many years. Because the chosen phonetics are easily recognised, this presents no problem, but do steer away from strange sounding words.

THE PROPAGATION OF SIGNALS

The ionosphere is created by the bombardment of the upper atmosphere by the ultra-violet radiation from the sun. Without the ionosphere there would be no long distance radio communications. The various layers of the ionosphere have varying effects on radio signals and the highest frequency at which a vertically projected signal would return to earth is called the Maximum Usable Frequency (or MUF) for a zero length path between two adjacent earth points. This MUF will be the factor which determines what you may eventually hear and on what frequency. Towards the peak of the last 11-year cycle of sunspot activity, by using receivers which could tune from about 25 MHz upwards, I found it very interesting to observe the gradually rising MUF on certain days. At times there would be signals on 28 MHz but nothing around 40 MHz. Later, signals from the USA would be heard at 40 MHz and as the MUF climbed higher, television signals from Asia would be observed around 48 MHz heralding a possible 50 or 52 MHz opening before long. Sometimes the MUF would go on climbing, to over 100 MHz to provide extended distance signals on the 144 MHz band, and so on. The commercial FM band between 88 and 108 MHz is a good pointer to a high MUF, eg if you live in Alice Springs and can hear Adelaide FM stations, then you would certainly be hoping for some two metre contacts eventually.

SPORADIC E PROPAGATION

This is probably the most widely observed phenomena and appears to be supported by highly ionised patches in the ionosphere around 100 kilometres above the earth. Sporadic E (or Es) propagation is highly unpredictable thus its name "sporadic E". Es most often occurs during the late spring and the summer months with a minor peak around mid-winter. However, so sporadic is its nature it is quite capable of appearing at any time, day or night. Whenever it appears, it can be observed for many hours, or even days, before disappearing, or it may last a few seconds giving you time for one quick contact before it goes. Any length of time between those limits is possible! Signals can vary from extremely strong to very weak, with heavy or light QSB or fairly steady.

If the MUF is relatively high, the signals can be very strong over short distances, say 600 kilometres. This is known as short skip. Normally, a distance of around 1600 kilometres is considered about optimum for one hop transmissions. Double and triple hop transmissions allow contact to places like New Zealand and other areas of the Pacific, depending on where you live, of course. Multiple hop transmissions may be somewhat weaker, but many contacts between VK5 and ZL have been at S9 plus.

Short skip transmissions on 28 MHz are pointers to a possible 52 MHz opening in due course, while short skip on 52 MHz could indicate a possible two metre opening. It used to be considered that two metre Es openings occurred about one thirtieth of the times that six metres opened. In the light of events in recent years, in Australia anyway, those predictions would seem to be rather conservative. A word of advice — if you are fortunate enough to be involved in a two metre opening, don't waste words on unnecessary chatter, exchange signal reports and names, sign off and get on with the next contact. The opening may only last a minute or two and you will deprive yourself and others of contacts by blabbing too much! Should the band stay open for an hour or so, as it can at times, then by all means go back and have some longer contacts, but still let late-comers break in if they let their presence be known.

Another factor which should be considered is that there is a tendency for Es to "follow the sun". I say tendency, because Es is sporadic, but there have been many occasions when it has been possible to work stations where the sun has already been for some hours, before you can work other areas, eg eastern coast stations might expect to work FK and ZL earlier than stations in VK5. As the sun moves over from the east (actually the earth rotating), VK5 would expect to hear stations in, say, VK2. FK and ZL stations may then be mixed in with the Australian stations.

The statement is open to challenge, but has not been totally disproved, that during periods of low sunspot activity there appears to be an increase in the openings due to Es, with a consequent rise in possible Es contacts on two-metres. Whether such statements are accepted or not, what is true is that Es appear each year to provide a whole series of interesting contacts for many people.

One proviso did arrive last year when a large solar flare around December 18, disrupted the usual pattern of six metre operating and reduced the normally hundreds of contacts to a mere handful for many operators, those suffering the most appear to have been in Western Australia, who, at the best of times, do not experience the range of contacts available to the eastern States.

BACKSCATTER

Backscatter is an unusual form of propagation which can support communications over considerable distances, but often the stations involved will be perhaps 300 to 400 kilometres apart, or less. The received signal is characterised by a somewhat hollow fluttery sound, at times difficult to decipher. However, I have known instances when the signals have been quite clear.

A backscatter contact takes place when two stations point their antennas at a common spot in the ionosphere and work by the reflection from that spot. At the moment, contact by any other means is not usually possible. Signals are often weak, but again, can be unusually strong! To prove whether the received signal is in fact backscatter, point your antenna on the direct path to the other station. If he cannot be heard then it will be backscatter.

Backscatter is not uncommon on 10 and six metres. There have been reports of it occurring on two metres.

TRANS-EQUATORIAL PROPAGATION

Around 1947, amateurs first observed this form of propagation, commonly referred to as TEP, and occurs in the F2 region of the ionosphere. Contacts occur more commonly in areas centred about 4000 kilometres either side of the geomagnetic equator and amateurs as far apart as 1500 kilometres situated in these belts are able to contact amateurs similarly situated on the other side of the equator. Hence the contacts between Japan and Australia. TEP occurs mostly in the late afternoon or early evening and opportunities appear to exist more often during spring and autumn and peaking for perhaps a month after the equinox, but again, wide variations do exist.

The signals can be extremely strong and tend to fade rapidly up and down, but still leaving communication possible. When propagation is good, it is no trouble to work Japanese stations with 10 watts or less on six metres.

The occurrence of TEP is tied to the sunspot cycle, occurring more often during periods of high sunspot activity, but there are many recorded instances when TEP has occurred spasmodically. Stations in the northern half of Australia are more favourably situated to use this phenomenon than those in southern latitudes, contacts being made on a fairly regular basis for several months of the year.

F2 PROPAGATION

Another interesting form of propagation is commonly known as F2 propagation and is also supported by the F2 ionosphere, that portion situated about 400 kilometres above the earth. Like all other modes, it too can be spasmodic, but again, appears to be linked to the sunspot cycle. This mode is capable of supporting very long distance communication in almost any direction. In the past, discussions have occurred as to what form of propagation may have supported a particular contact, F2, TEP or what?

From the Australian viewpoint, one could expect that the contacts made in the past between Australia and such places as Hawaii, USA, Alaska, Mexico, Canada and the more distant points in between, would have been via F2. Contacts to other places more to our north, such as India, Nepal, Indonesia, etc, may have been F2 or TEP, or a mixture of both, or either or both, supported by a Es content, who knows? Then, there were the "nearly made it" contacts to South Africa, crossband 10 metres to six metres.

At the peak of the sunspot cycle, when such contacts were more common, it seemed most contacts were being made either during the morning before 0000 UTC and in the case of places like Mexico, as early as 2200. Late afternoon contacts are also possible. It is all based upon being vigilant and being there at the right time.

THE SUMMARY

Most of the above has been orientated towards six metres which, in the first instance, will probably receive a high degree of attention by a newcomer. Two metres Es has been mentioned. Evidence seems to be unfolding that, under certain conditions Es may be possible on 432 MHz. Roger VK5NY get very close to establishing that fact in 1986 when he almost made it to Brisbane on that band under conditions which were certainly not tropospheric!

To deal with 144 and 432 and above adequately, will involve more time and space. This will be the subject of further discussions on another occasion. Subjects involved include coastal ducting, inversions, scatter contacts, aircraft enhancement contacts, etc.

It is hoped what has been said will help some on the way to sharing DX contacts. I use the word sharing purposely, because it is necessary to share a DX station with others. You will not be popular by hogging a contact with a rare station to the exclusion of others.

What has been written is couched in terms the layman can understand. Maybe someone will want to pull apart what I have said, if so, so be it! What has been written is essentially factual and should be capable of helping most who feel a need to be helped. If someone, as a result, is able to improve their DX operating skills, then that is all the satisfaction I seek!

CLOSURE

In closing may I again urge all VHF operators who wish to participate in possible DX operating, particularly on six metres, that their equipment should be ready and operating at peak efficiency by now. From this time onwards the unexpected can happen at any time — what a pity to miss out on a contact, say, to the USA because you antenna was on the ground being repaired!

Closing with two thoughts for the month: "People who have what they want are fond of telling people who haven't what they want that they really don't want it." And: "The world is moving so fast these days that the man who says it can't be done is apt to be interrupted by someone doing it!" 73. The Voice by the Lake.

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CONTEST CERTIFICATES

During the current review and re-organisation of the Federal Office of the Wireless Institute of Australia it has come to my attention that several amateurs believe they have not received certificates for contests they have won.

Institute records show that all certificates were prepared and forwarded to the winners. However, if you have won a contest in the past few years, and have not received your certificate, please advise the Federal Office by writing to:

Contest Certificates
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic. 3162

On receipt of the details of valid claims, a duplicate certificate will be issued promptly.

Bill Roper VK3ARZ
General Manager and Secretary

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QSP

CHIP TRACKS KILLER BEES

A tiny computer chip has been developed to track killer bees. Engineers for major US defence contractor Martin Marietta, known for producing MX missiles and laser-guided artillery shells, developed the chip.

About the size of a half-carat diamond and weighing about as much as a grain of salt, it was part of an integrated circuit that would be attached to captured bees' mid-sections.

The device, powered by nine solar cells, can transmit an infrared signal that can be picked up by a ground station up to a mile away.

A killer bee transmitter is expected to be in the field by next year.

Killer bees, although aggressive but generally not deadly, are descendants of African queen bees.

Since escaping from a Brazilian laboratory in 1957, they have migrated as far as southern Mexico, and are expected to cross into Texas as early as next year.

Scientists hope that, by being able to track the insects, they can control the migration without using large quantities of pesticides.

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TOPICAL TECHNICALITIES

Lindsay Lawless VK3ANJ
PO Box 112, Lakes Entrance, Vic. 3909

Telecommunications is the exchange or dissemination of information at a distance by means of signals in the presence of noise. The signals must be more powerful than the noise or capable of separation from the noise.

The apparatus used to amplify and detect signals generates internal electrical noise and it is important to reduce the internal noise to an acceptable minimum. How do we measure the success of our efforts?

One method is to connect a signal to the apparatus input and measure the signal to noise (S/N) ratio at the output. The acceptable S/N ratio depends on the application. A 6 dB S/N ratio was considered suitable for communications receivers and I recall many happy (?) hours spent trying to persuade Kingsley AR7 receivers to produce one watt output with a S/N of 6 dB from an RF input of one microvolt. That measurement was actually a signal plus noise to noise ratio because signal and noise could not be separated. Better methods have since been devised to assess apparatus noise performance, based on comparing the total noise output with an ideal device with no internal noise. The specifications for modern devices however, continue to quote performance in terms of S/N ratio.

The modern receivers in my shack claim sensitivities and S/N ratios not much better than the ancient AR7; for example:
0.25 uV for 10 dB S/N on J3E HF
1 uV for 10 dB S/N on A3E HF
0.5 uV for 20 dB S/N on J3E VHF

My store-bought microphone amplifier claims a S/N of 60 dB, but fails to specify an input. How accurate are those claims and are they suitable for our purpose?

Electrical noise generated by electrons absorbing heat energy is the minimum noise level attainable in apparatus; it is predictable however, and serves as a standard for comparison with noise generated by other means. The available noise power from thermal generated sources is -174 dBm per Hertz of bandwidth at a temperature of 17 degrees Celsius (290 degrees K). The only factors which will alter that power are temperature and bandwidth:

P_n = KTB watts ..... (1)
P_n = KTB x 10^3 milliwatts ..... (2)
P_n = 10log.(KTB x 10^3)dBm ..... (3)
K = 1.38 x 10^{-23} Joules per degree.
T = temperature in degrees absolute.
B = bandwidth in Hertz.
dBm is power level referred to one milliwatt.

A temperature of 290 degrees is accepted as the most likely operating temperature of Telecom apparatus and the following thermal noise power levels at that temperature are worth noting:

P_n = -174 dBm per Hertz.
P_n = -139 dBm when B = 3 kHz.
P_n = -134 dBm when B = 10 kHz.
P_n = (-174 + 10log.B) dBm.

My desk microphone produces an open circuit output of 40 uV with a 'Sound Pressure Level' (SPL) of 70 dB reference the threshold of audibility (2.04 x 10^{-5} Pascal); that is approximately the SPL of ordinary conversation at a distance of one metre. The matching impedance is 600 ohms therefore the conversation level to the microphone amplifier is -92 dBm and the maximum possible S/N ratio if B = 3 kHz is 47 dB and 42 dB if B is 10 kHz. The claimed 60 dB S/N at a bandwidth of 15 kHz is impossible at conversation levels; maybe it is intended for use with a rock band!

Suggestion: when buying an amplifier, be sure you know the expected output level of your microphone and ask for performance specifications at that level.

My VHF receiver bandwidth on SSB should be about 3 kHz and the minimum noise power referred to the input -139 dBm. The specification sensitivity of 0.5 uV at the 50 ohm input is a power of -113 dBm, therefore the maximum possible S/N ratio is 26 dB. Apparently the internal receiver noise degrades the S/N ratio to 20 dB therefore the 'Noise Figure' is 6 dB. Disappointing and not suitable for EME or other low noise applications.

To complete the discussion, we present an explanatory diagram — Figure 1. R is the matched source resistance of a receiver or amplifier and:

$P_S = E_i^2/R$ or $E_S^2/4R$ ..... (4)
$P_n = E_n^2/4R = KTB + Pni$ ..... (5)
Pni = Appliance internal noise referred to the input.
$E_n^2 = 4KTBR$ ..... (6)

If the S/N ratio is 20 dB as specified for the VHF receiver, and E_i is 0.5 uV then E_S = 1 uV and the receiver equivalent noise input is 0.05 uV and

E_S/E_n = 1/0.1 = 20 dB.

if the receiver has no internal noise the ideal S/N is

E_S/E_n = 1/0.05 = 26 dB.

For further information about the above, the excellent *Technical Mailbox* discussion in AR, August 1987, is recommended.

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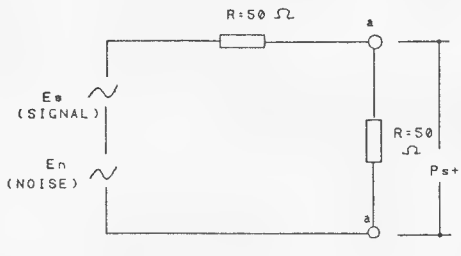

Figure 1.
Ps = Es²/4R = Ei²/R
Pn = En²/4R = KTB + Pni
Ei = signal volts at appliance input a-a
Es = open circuit signal volts at a-a
En = open circuit noise volts at a-a
Ps = signal power
Pn = Noise power (total)
Pni = equivalent appliance noise power

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

During 1988 we have seen an increase in YL activity on all bands due to the proliferation of YL awards available this year, plus improving propagation.

In my case this means much leafing through logs and counting of contacts; meeting friends on the air that I have not heard in years, and many YLs I have never spoken to before. Some I have met, some I will never meet. It is still good to exchange a friendly greeting!

As one DX ALARA member said; "It's a pity politicians aren't radio amateurs — we all seem to be able to get along together."

Not entirely true, perhaps, but due to the nature of our hobby perhaps we "get along together" better than most.

The following was written by Inge Tobias de Agular PY2JY, and sums it up very well.

MEDITATION OF A YL RADIO AMATEUR

My Lord, if I should die now, I would go happily for I know the meaning of friendship, affection, co-operation and unselfishness.

Since my first day as a radio amateur and till today nobody has let me down.

From south to north, from east to west, I have friends whom when they hear me are happy to meet me again.

I will never come across many of these friends except through QSLs and letters but in their voices I perceive the happiness of our re-encounter.

Some of them I met personally somewhere in this world, received me as if I were their sister, and we enjoyed ourselves like true brothers and sisters.

I never was alone in emergencies, in which I helped out,

I always had friends that helped me, and there you can see that radio amateurs always work together.

This is Friendship!

To be a radio amateur is to live with happiness; happiness of having so many friends which one can depend upon, happiness to be able to help somebody in need, sadness when giving bad news, happiness in meeting others, happiness in meeting again, happiness in unselfish help, happiness of having accomplished a mission.

X X X (From May/June *YL Harmonics*)

YLRL CONVENTION 50TH ANNIVERSARY — HAWAII — JUNE 27-30, 1989

Proposed Schedule:

Tuesday June 27	Arrive Honolulu
Wednesday June 28	Tour Bishop Museum in Honolulu Fly to the Garden Island of Kauai in the afternoon Board meeting in the evening
Thursday June 29	YLRL Forum in the morning Island tour in the afternoon
Friday June 20	Board meeting, tours If the attendance is as high as indicated so far, the final banquet this evening will be a LUAU (on chairs — not the floor)

(From May/June *YL Harmonics*)

YL RADIO CLUB OF ITALY

Helen Grosso I7KAX, is DX Chairman of the YL Radio Club of Italy. She is hoping that, with propagation opening up it will once more be possible to make contact with YLs in the Pacific area. Concerning the Italian YL Club, she says;

"Our club consists of about 100 members, more or less. We meet every Monday on 7.050 MHz at 1230 UTC. We hold a general meeting annually, and elections bi annually. Our President is Olga Scolari, Via Conte Verde 50, 00185 Rome. Our Secretary, Santina Lanza, Via F Todaro Is, 206n 7, 98100, Messina. Three or four times a year we publish a newsletter in Italian and English."

VK4 STATE REPRESENTATIVE

For personal reasons Josie VK4VG, has found it necessary to resign from the position of VK4 State Representative. The new VK4 State Representative is Cathy VK4CEK. Our thanks to Josie for her contribution to ALARA as her State's Representative.

BIT AND PIECES

Gwen VK3DYL, is safely back in chilly Melbourne, and wishing she could have brought back some of the hot weather encountered in the USA after a wonderful trip and warm hospitality.

With improving propagation, North American YLs are staying up late and burning the midnight oil to come on the 222 YL Net each Monday at 0600 UTC. It is great to catch up with so many we have not heard for a long time.

A nice surprise early in July when Val VK4VON/ ZL3GW, came on the ALARA Net, during a holiday in Queensland. Val lives in a remote area of New Zealand, and finds amateur radio a great way to "keep in touch".

Congratulations to Christine VK5ZCQ, now VK5KTY.

Congratulations also to Geoff VK3AZI and Patricia VK3PRV, on the arrival of little harmonic, Suzanne Abigayle on May 20. A sister for Tiffany.

Angie G0CCI and Nigel G4IJF, were married in March. Our sincere wishes for their future happiness.

NEW MEMBERS

A warm welcome to Pat VK4PT, Marlene VK3FML, and sponsored members Masayo JR5MVX, Gwen ZL2NAD and Rita G0EIX.

Until next month, 73/33.

ar

THE BRICK COOLER

David Barneveld VK4BGB
PO Box 275, Booval, Qld. 4304

Heat generation a problem in solid-state VHF amplifiers?

If you have ever used one of those solid-state VHF amplifiers, you will be only too aware of the problem of heat generation after extended periods of operation. A simple remedy for this would be to place the amplifier in the refrigerator and drill holes in the side of the cabinet to take the coaxial cable, etc. The only drawback now is that the heat has been transferred over to your spouse who will probably blow a "safety valve".

A simpler method is outlined in this article! As the bulk of the heatsink is situated on the top of that amplifier, a small muffin fan can be attached easily to the top to blow air downwards onto the heatsink, and greatly increase the heatsink-to-air thermal transfer. This method was tried quite successfully with a 130 watt amplifier. The heatsink temperature dropped from unbearable to moderately warm.

For those not wishing to drill holes in the side of the heatsink, the bracket could be held on reasonably well with double-sided tape, provided the unit was not moved too much.

A mesh grill across the top of the fan will stop "sticky-fingers" being amputated!

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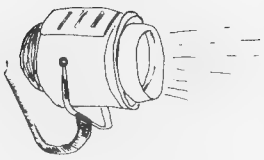


Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Yet another exchange agreement between two international broadcasters has come into effect. This time, Radio France Internationale and Radio Japan have commenced broadcasts via their transmitting facilities as from early August. Radio Japan will be using the French relay base in Montsinery, French Guiana, with 500 kW senders to reach South America. Broadcasts will be in Portuguese and Spanish as well as Japanese. It is a little known fact that there are over one million Japanese emigres in Brazil alone. Broadcasts reportedly will be on either the 25 or 31 metre band at around 0300 UTC.

Conversely, Radio France Internationale from Paris will be heard via the NHK senders at Yamata, Japan, with a relay of French programming, beamed to western and south-eastern Asia. The 19 metre channels are reportedly being used between 0930 and 1130 UTC. At compilation time, the frequencies were unclear, so if you do hear strong French programming on the 19 metre band it very well could be Paris via Yamata.

Incidentally, Radio Japan via "Africa No 1" is coming in well here on 15.235 MHz in either English, French, German or Japanese around 0600 UTC. The target area is Europe and signals are excellent. Interestingly, Tokyo is also scheduled to use the same channel to Australasia at the same time from Yamata with their General Service. But the signals are well down under "Africa No 1". So much that I believe that they have stopped using Yamata until after the signals from Gabon go off, than Yamata comes in excellently. I also note that occasionally the satellite feed from Tokyo drops out on the Gabon signal, and the station reverts to pre-programmed musical interludes with bilingual identification announcements. It must be a frequent occurrence because "Radio Prague" commented that the tape filler was better audio-wise than the satellite feed.

Radio Beijing and Radio Canada International have also been negotiating an exchange agreement over sharing senders. Montreal is reportedly wanting to improve their signal over Japan, although they have been utilising the Yamata site for nine months for their Japanese programming. Apparently signals are skipping over Japan, hence RCI's interest in using a northern Chinese site to reach mainland-Japan. The Chinese also wish to improve their signal level and presence in to eastern North America, despite using the Canary Islands site of Spanish Foreign Radio and Mali. The latter reportedly has been disappointing, yet not surprisingly as the African senders in Bamako are only 50 kW.

The Seychelle Relay of the BBC will have commenced testing by now. The actual channels are not known but will be long-established channels serving eastern Africa. Programming will be shared equally with World Service and the African Service.

The Olympic Games will be commencing this month and many international stations are scheduling live broadcasts. The BBC World Service is one that has decided to split the World Service and several channels will reportedly carry live descriptions. Most stations will have regular updates.

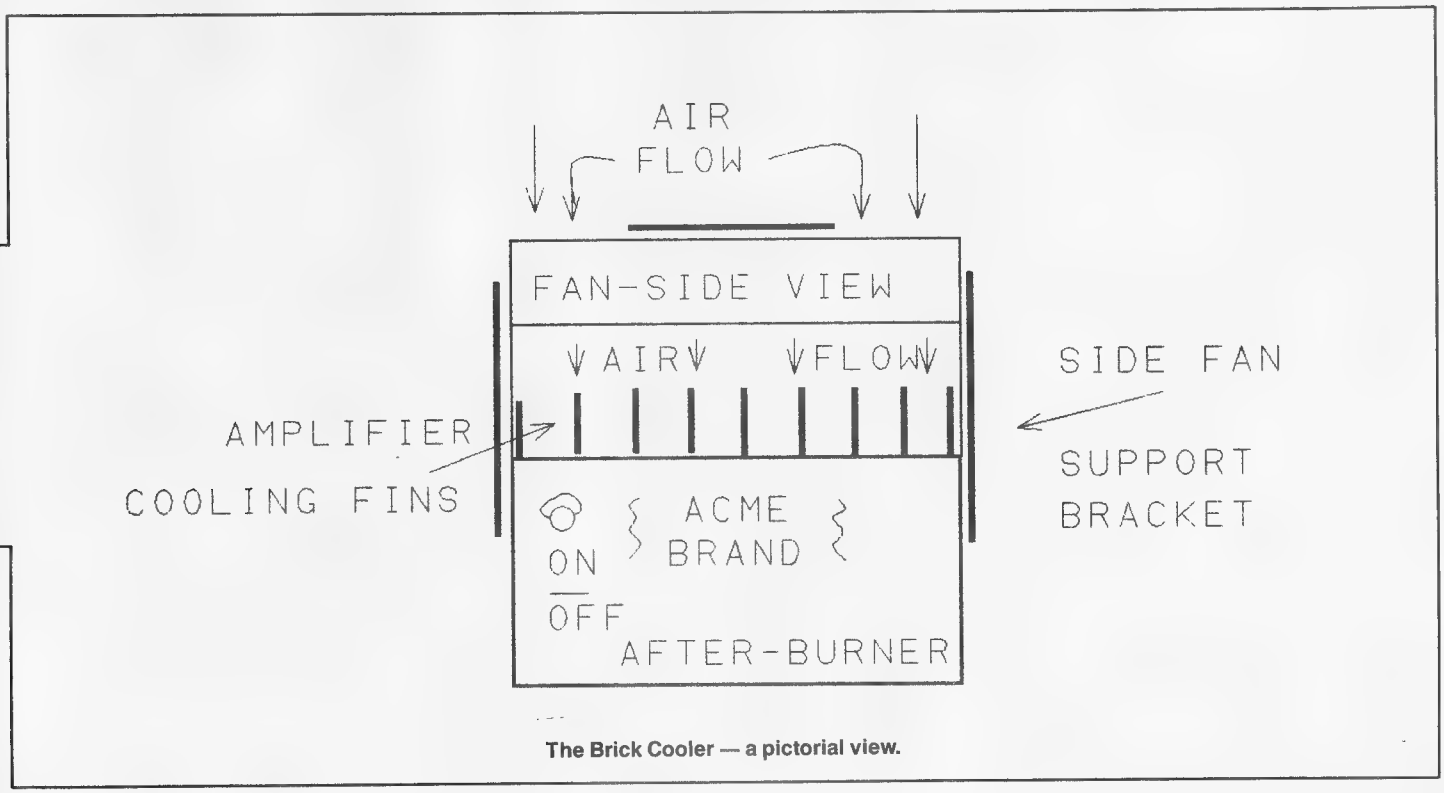
The *International Listening Guide* arrived unexpectedly in the mail box in late June, some seven weeks late. In view of adverse publicity, I had expected that it would fold, but it has bounced back. They have made some alterations to the editions, dividing it up with four editions of the External Services broadcasting in French and English throughout the year and a frequency summary of usage each May and November. It has become a very tall order to publish a frequency summary four times a year plus English and French language broadcasts.

The current issue is again excellent, if not indispensable to the serious monitor. Those interested might find the abbreviations and symbols a little bewildering at first, but it is easily mastered. The price has increased to $A30 per annum and may be ordered via their Australian agent, Howard R Moore, 33 Brooklyn Avenue, Salisbury, SA. 5108. The Australian Radio DX Club were agents as well but I note that they are not listed as such in the current edition.

As for the much-publicised *International Broadcasting Handbook* — there is no word! Many people, I believe, in good faith ordered it in advance, being unaware of the difficulties the individual had in getting it published. Some have asked for their money back and even have turned very nasty. I believe that the publication of the handbook has been postponed and, as mentioned several months ago, it would be wise to wait and see if it is published and reviewed before ordering.

Do not forget that the S-88 period commences on Sunday, September 4, at 0100 UTC, yet major changes can be expected on Sunday, September 25, when Europe goes off Summer Time.

In conclusion, I must apologise to those who have been writing to my old address, that has been inadvertently listed at the masthead of this column. Sorry it has taken so long to reply, but if they had arrived at the correct address I could have replied sooner! The correct address is 52 Connaught Crescent, West Launceston, Tas. 7250. Until next time, the very best of 73 and good listening!



The Brick Cooler — a pictorial view.

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7277

CONTEST CALENDAR

SEPTEMBER 1988

10 — 11 European DX Contest SSB Section (Rules July issue)
10 — 11 IARU ATV International FSTV Contest (Rules this issue)
17 — 18 Scandinavian CW Contest (Rules this issue)
24 — 25 Scandinavian SSB Contest (Rules this issue)

OCTOBER 1988

1 — 2 VK-ZL-Oceania DX Contest (Rules August issue) SSB Section
8 — 9 VK-ZL-Oceania DX Contest CW Section
8 — 9 IRSA Radiosporting Contest
— 9 RSGB 21/28 MHz Phone Contest
— 21 RSGB 21 MHz CW Contest
29 — 30 CQ WW DX SSB Contest

NOVEMBER 1988

11 — 13 Japan International DX Contest
12 — 13 European RTTY Contest
12 — 13 OK DX Contest Phone and CW (Rules this issue)
— 12 ALARA YL/YL Contest (Unconfirmed date)
— 13 BATC SSTV/FSTV All Bands Contest
26 — 27 CQ WW DX CW Contest

29TH SCANDINAVIAN ACTIVITY CONTEST RESULTS

The 29th Scandinavian Activity Contest results have now been announced and I will list the VK participants and the scores obtained.

1. VK2BQQ 4840 points
2. VK4TT 840 points
3. VK4XW 630 points
4. VK4XA 357 points
5. VK5AGX 300 points

The continental plaque winners in the CW section are:

Africa JG1FVZ/5N0
Asia UA9SA
Europe YU4AU
North America VO1SA
Oceania YB2FEA
South America PK2KT

And in the Phone section are:

Africa EA9IE
Asia UA9TS
Europe UT5DK
North America VO1SA
Oceania YC2CTW
South America CX8BBH

DXers will note how familiar most of the listed call signs are and how they can be heard in most of the big pile-ups generated by DXpeditions.

29TH SCANDINAVIAN ACTIVITY CONTEST — 1988 RULES

CW — September 17, 1500 UTC to September 18, 1800 UTC.
Phone — September 24, 1500 UTC to September 25, 1800 UTC.
Logs to be forwarded to the SSA Contest Manager, Jan Eric Rehn SM3CER, Lisataet 18 86300, Sundsbruk, Sweden.
General rules for non-Scandinavians are as follows:
1. Aim of Contest — to promote communications skills between amateur stations world-wide. Non-Scandinavians will try to work as many Scandinavian stations as possible.
Scandinavian stations are defined by prefixes as follows:
LA, LB, LG, LJ (Norway), JW (Svalbard and Bear Island), JX (Jan Mayen), OF, OG, OH, OI (Finland), OH0 (Aland Island), OJ0 (Market Reef), OX (Greenland), OY (Faroe Islands, OZ (Denmark), SJ, SK, SL, SM (Sweden), TF (Iceland).
2. Eligible entrants: radio amateurs as well as SWLs world-wide.
3. Periods: CW third full weekend in September — Phone fourth full weekend 4. Sections—
a) Single operator single transmitter, all bands only. Single operator single transmitter, all bands QRP. Single operator: one person performs all operating logging and spotting functions. only. Multi-operator must remain on the same band for at least 10 minutes. QRP operators may use stations with a maximum input of 10 watts.
b) Multi operator single transmitter, all bands only. Only one signal allowed at any time on any band. The station must remain on the band at least 10 minutes after first QSO on that band after band change.
c) SWL. Only single operator, all bands. Log must contain: Date/Time UTC, band, station heard, message sent by Scandinavian station, SWLs own report, station worked by Scandinavian station, multiplier, points. Only Scandinavian stations may be logged for points. Scoring as for transmitting sections.
All Sections:
The use of multiplier spotting assistance from other persons than the station operator/s is not allowed.
5. BANDS — 3.5, 7, 14, 21, and 28 MHz according to IARU band plans.
3.560-3.600, 3.650-3.700, 14.060-14.125 MHz should be kept free of contest activity.
6. EXCHANGES — Consist of RS/T plus a serial number starting with 001. QSO after 999 are numbered 1000, 1001, etc. The same station may be worked once on each band. Only CW/CW and phone/phone QSOs are valid.
7. SCORING — Two way QSO with sent and received exchange counts for QSO points. Non-Europeans score one point for every complete Scandinavian QSO on 14, 21 and 28 MHz and with three points for such QSO on 3.5 and 7 MHz.
8. MULTIPLIER — Worked all call number areas (0 to 9) are valid on every band in each Scandinavian country.
Portable stations without district number counts for the 10th area; eg G3XYL/LA counts for LA0.
OH0 and OJ0 OH0M are separate call areas. SJ9 counts for the ninth call area in SM. (eg SM3, SK3, SL3 count as one multiplier, not three multipliers on each band).
9. FINAL SCORE — Multiply the sum of QSO points from all bands with the sum of multipliers worked on all bands.
10. LOGS — Signed original logs (or copies of original logs) must be submitted separately for CW and phone. Logs to be filled out in the following order; Date and time in UTC, Station worked, sent and received exchange, band, multipliers (eg OZ4, SM4, OH0, etc) and points.
SWL logs must contain; Date and time in UTC, band, Scandinavian station heard, message sent by Scandinavian station, SWLs own report, station worked by Scandinavian station, multipliers, points.
SUMMARY SHEET — All entrants must be followed by a summary sheet showing station call sign, category, name of operator/s and address. Indicate number of QSOs per band less duplications, number of duplicates per band, multipliers per band, QSO points per band and final score.
MULTIPLIER SHEET — All entrants must submit a multiplier sheet for each band with more than 200 QSOs.
DUPLICATE QSO SHEET — Possible duplicate QSOs must be shown in the log and counted for zero points. Each entrant shall submit a duplicate QSO sheet for each band with more than 200 QSOs. Duplicate sheet to contain worked stations lists, eg DXCC countries and call areas.
11. DECLARATION — By his/her signature on the summary sheet the participant declares, that all rules are observed and that the station was operated in accordance with the rules and regulations for amateur radio stations in the country of the participant.
12. ADDRESS FOR LOGS — The arrangements alternate between SRAL, SSA, NRRL and EDR. See above for this year's address.
13. CLOSING DATE: Logs and sheets, addressed to the organising league shall be mailed not later that October 30, 1988.
14. AWARDS — Top scorers in each country, in each category, additional awards depends on the number of entries received.

Thanks to Eric OH4NR/OH8RC/OH6DX/OH7RS for these rules. Please note that the 31st SAC in 1989 will be arranged by NRRL Norway.

The whole book of results and rules, etc, contains 49 pages and for obvious reasons I have only used the relevant sections of interest to VK amateurs. Good luck to you and I hope to be able to list a couple of VK call signs as winning the Oceania plaques after this next contest.

VK2BQQ has kindly sent a copy of the rules for the OK DX Contest. These, like the SAC and BERU remain virtually the same each year so it would be a good idea to take a photocopy of them.

OK DX CONTEST 1988 RULES

The Czechoslovakian Central Radio Club has the honour to invite amateurs world-wide to participate in the annual OK DX Contest.
1. CONTEST PERIOD — Every second full weekend in November.
1988 November 12/13.
1989 November 11/12.
24 hours, 1200 UTC Saturday to 1200 UTC Sunday.
2. MODE — CW and Phone.
3. BANDS — 1.8, 3.5, 7, 14, 21, 28 MHz.
4. CATEGORIES
a) Single operator all bands.
b) Single operator single band.
c) Multi operator all bands (club station).
d) SWL.
Any station operated by a single person obtaining assistance such as keeping the log, monitoring other bands, tuning the transmitter, etc, is considered to be a multiple operator station. Club stations my compete in Category C only. Only one transmitter and one band is permitted during the same time period (defined as the 10 minute rule). That means a station can change bands after 10 minutes operation on it.
5. CONTEST EXCHANGE — Signal report (RS or RS/T) and number of ITU zone.
6. SCORING — A station may be worked once per band regardless of the mode. Cross-mode and cross-band contacts are not valid.
One point for a complete contact with anther DXCC country.
Three points for a complete contact with OK/OL station (OK4/MM counts one point for everyone).
Zero points for complete contact with own DXCC country (counts only as a multiplier).

7. MULTIPLIERS — Sum of different ITU zones worked on each band.
8. FINAL SCORE — Total QSO points from all bands times the sum of the multipliers.
9. LOG INSTRUCTIONS
1. All times must be in UTC.
2. Indicate zone multiplier only for first time it is worked on each band.
3. Logs must be checked for duplicate contacts, correct QSO points and multipliers.
4. For each duplicate contact or multiplier that will be removed from the log by the committee, a penalty of three additional contacts of the same points will be exacted.
5. Use separate sheet for each band.
6. Each entry must be accompanied by a summary sheet showing all scoring information, category, contestants name and address and a signed declaration that all contest rules and regulations have been observed.
7. All entrants are encouraged to submit cross-check sheets for each band on which 200 or more QSOs were made.
10.AWARDS — First place certificate will be awarded in each category for top scoring station in each DXCC country, all scores will be published.
THe "100 OK", "OK SSB" and "SLOVENSKO" awards may be issued upon a separate application (No QSL cards are required for contacts made during the OK DX Contest).
11. DISQUALIFICATION — Violation of amateur radio regulations in the country of contestant or the rules of the contest, operation in an unsportsman-like manner, manipulating scores or times to achieve a score advantage, unverifiable contacts and multipliers are grounds for disqualification. Decisions of the contest committee are final.
12. DEADLINE — All entries must be postmarked no later than December 15, and should be mailed to: The Central Radio Club, PO Box 69, 11327 Parha 1, Czechoslovakia.

Any photographs from the contestants will be appreciated . . . OK2FD, OK Contest Manager.

A letter from the BATC Contest Manager, Mike Wooding, 5 Ware Orchard, Barby, Nr Rugby, Warks, CV23 8UF, UK, informs us that the contest to be held this month is now an official IARU contest, and that the European societies have agreed that the contest will be run by a different member country each year. This next contest will be run by Belgium and the BATC will run the 1989 contest. Mike did not send a copy of the rules so it will be up to you slow scan operators to find out as best you can for this year's event and I will try to get a copy in time to publish for the 1989 contest.

IARU ATV (International) Saturday, September 10, 1800 UTC Saturday to 1200 UTC Sunday FSTV. Operation is on all bands.

In the July issue of *Amateur Radio* the list of those amateurs who lost their lives when on active service during the second world war contained an error that had appeared some years ago and had not been corrected.

Don Shaw VK3PV/VK2BDS, has kindly put the record straight and I would like you to amend the list under VK3PV to read:
VK3PV R P Veall, Australian Merchant Navy.

VK/ZL/OCEANIA SAMPLE LOG

After all the many and varied logs that came in for the 1987 contest, and as I felt some stations were perhaps "missing out", in order to help future contest managers it would be appreciated if entrants use summaries similar to the following:

SUMMARY SHEET
VK/ZL/OCEANIA CONTEST 19XX
SSB SECTION ON XX XX 19XX
VK4AHD

Brian Beamish VK4AHD
35 Chester Road
Eight Mile Plains, Qld. 4123

BAND	QSOs	POINTS	MULTI-PLIERS	SCORES
		(For individual bands)		
160	16	320	6	1920
80	46	460	15	6900
40	155	775	110	85250
20	166	166	93	15438
15	111	222	73	16206
10	25	75	23	1725
TOTAL	519	2018X	320 =	545760 points

All rules and regulations have been observed to the best of my knowledge and checked for any duplicates, etc.

Signed: Brian Beamish VK4AHD
XX XX 19XX

VK/ZL/O CONTEST 1987 RESULTS

ASIA CW			
HL1LW	1160	HL1XP	1968
JA1AAT	84	JA1BNW	3472
JA1BUN	1260	JA1JGP	704
JA1OP	24	JA1YAD	3080
JA2DN	3248	JA2KPV	312
JA3UWB	1924	JA4AQR	40
JA6BWH	1700	JA6SHL	1584
JA7ASD	2340	JA7YFB	2968
JA8CJY	320	JA9CWJ	60
JA9FT	39	**JA0DAI***	**14884**
JE1AER	3432	JE1CKA	9400
JE2IEQ	3024	JF2VDY	5070
JH3JYS	280	JH6WHN	72
JH8GEU	3596	JI6DMN	96
JO1QZI	570	JR3BOT	5668
JR4ISK	8		
ASIA SSB			
HL1LW	4864	HL1XP	6084
JA1BUN	578	JA3SSB	40
JA3YBF	10530	JA4CUU	6960
JA6QDU	154	JA7AQR	4234
JA7YFB*	**16800**	JA8YBY	15744
JA9YBA	4032	JA0UMV	3036
JE1AER	4028	JE2IEQ	3060
JF1XOO	18	JG3QCW	3848
JH2SGC	126	JH6WHN	40
JI6BJQ	378	JK3QZU	9912
JL3WSL	1040	JO3DWD	8
JS1WOZ	72	JR1ZTT	630
JR2TRC	50	JR3BOT	7514
JR3KAH	264	JR4ISK	18
JR5EPR	25	JR7OMD/2	510
ASIA SWL			
JA8-5871	242	**JA8-3769**	**648**
USSR CW			
RA0JJ	720	RA0YB	CHECK
RA1QE	CHECK	RA3DX	2784
RB5IA	320	RB5MA	650
RB5UX	CHECK	RB5WA	616
RB5WR	162	RW4LYL	1510
UA0BCK	306	UA0LCZ	3888
UA0QO	4144	UA0SAU	10620
UA1OIZ	CHECK	UA1OT	48
UA1QCC	32	UA3EAY	CHECK
UA3PB	CHECK	UA3PNN	24
UA4HNP	4270	UB4JZV	320
UA4NBH	CHECK	UA6AF	1232
UA6LCT	396	UA9NN	312
UA9SAW	CHECK	UA9UZC	476
UA9XCI	40	UA9XR	216
UA9YI	5772	UB0YW	442
UB3IWA	9800	UB4MZL	3038
UB4ZWB	4216	UB5EF	CHECK
UB5IKN	380	UB5INN	546
UB5IRM	594	UB5NQ	240
UB5QGD	CHECK	UC1AWZ	57
UC1WWF	736	UC2ACZ	504
UC2AS	CHECK	UD67DZ	65
UD6DKW	6	UI9AWX	INCOMPLETE
UJ8JA	2976	UL7CAC	16
UL8CWW	198	UM8MAA	32
UM9MWO	468	UO5OAL	398
UO5WU	200	UP1BWW	3060
UP1BYL	504	UP1BZA	3456
UQ1GWW	11220	UT5DK	1480
UT5RY	80	UW3TU	286
UW6AU	CHECK	UW9AO	390
UZ0AXX	11550	**UZ0CWA**	**15444**
UZ0CWW	1122	UZ0JWA	7360
UZ0QWA	12100	UZ1AWT	6808
UZ1CXF	CHECK	UZ1NWO	50
UZ1OWZ	144	UZ1ZZZ	506
UZ4WWB	152	UZ6LWZ	2378
UZ6YWB	992	UZ9CWA	7380
UZ9OXI	598	UZ9XXM	18
USSR SSB			
RA0JB	CHECK	UA0FF	1035
UA0LCZ	260	UA0SAU	8970
UW0ZF	3776	UZ0QWT	1872
UW0ZF	CHECK	UZ0CWA	16324
UW0JWA	3776	UZ0QWT	1872
UW0WWA	144	UA1DZ	6528
UC1WWF	560	UQ1GWW	17670
UZ1CXF	756	RR2RR	1386
UC2AI	176	UP2BR	816
RA3DJA	CHECK	RA3DX	950
RZ3DX	1054	UA3ASL	CHECK
UA3TN	40	UV3DF	CHECK
UV3DN	CHECK	UA4HNP	2050
UA4NC	CHECK	UB4QWW	3000
UB4XWB	7140	UZ4FWA	196
RW4LYL	3038	RB5EX	CHECK
RB5DX	240	RB5LL	1508
RB5IA	392	RT5UO	CHECK
UO5OQ	28	UB5MNO	175
UT5RY	1088	UT5DK	2952
UA6LQ	6272	UF6DG	35
UD6DR	30	UZ6LWM	552
UL8LWA	2070	UL8CWW	3
UL8LWZ	1394	UM8MIG	72
UA9YI	3220	UI9BWE	2968
UZ9CWA	4896	UZ9OXI	992
UZ9XWH	176	UB4IZA	72
UB5IAK	1160	UB5WE	603
UI9AWH	352	UL8LYA	8692
UP1BZA	13224	**UZ0AXX***	**21172**
UZ0OWO	CHECK	UZ4WWB	224
RB5MF	6540	RL7JA	CHECK
RM8MA	432		
USSR SWL			
UR2-083-200	1840	UA2-125-217	58
UP2-038-1751	264	UP2-038-1580	
		24 HOUR	
UP2-038-1220	2016	UP3-170-565	32
UA3-170-372	328	**UB5-073-2589***	**8820**
UB5-073-3135	418	UB5-073-1610	1368
UD6-001-220	340	UM8-036-101	468
UA9-145-30	6996	UA9-161-264	572
UA9-154-2105	252	UA9-161-298	1620
UA9-167-837	752		
NORTH AMERICA CW			
KF1Z*	**1674**	N6ADI	1102
NL7DU	140	W8UVZ	850
NORTH AMERICA SSB			
K6SVL*	**4450**	VE3BXY	2
SOUTH AMERICA CW			
YV1OB*	**768**		
SOUTH AMERICA SSB			
LU1LDL*	**46**		
OCEANIA CW			
K1BAZ/DV1	11472	YB2FEA	5304
C21XX	**48372**	YB4FN	1620
YC0TMZ	726	YC5PD	5876
EUROPE CW			
DJ4SO	1428	DL1SV	588
DL3RD	208	EA1AUI	160
EA2CR	60	EA5CLO	140
G5MY	704	HA4XX	CHECK
HA5KHC/8	39	HA6KVB	884
HB9DX	396	HB9IK	1600
HB9MM	792	LA2EG	162

LA7MFA	264	LZ1KVF	18	**DL8FM***	**7956**	EA3AAY	924	Y36SG	CHECK	Y46IF	CHECK
LZ1KSP	672	LZ1LZ	1176	EA3ELM	CHECK	HB9DX	144	Y24NG	176		
LZ2TU	CHECK	OE7TKW	24	HB9IK	450	I1VXJ	484				
OF4RH	390	OH2PM	126	I8RS	2686	LA9REA	CHECK	EUROPE SWL			
OK1KZ	32	OK1OND	126	LZ1KSP	132	LZ2RS	CHECK	HA2-013	2160	LZ1C187	1490
OK1US	CHECK	OK1VD	1020	OE1TKW	32	OE3PSA	1064	**LZ1E229**	**6836**	OK2-3947	246
OK2BGR	32	OK2PDT	24	OF1ZAA	2100	OH1AD	3528	YO9-17412/TR	25	Y32-10-F	2522
OK3TAY	50	SM3CVM	CHECK	OH2BUU	182	OH2PM	1886	Y45-09-B	5028		
YO8CDQ	2	YO9BVG	18	OH6PA	160	OF3GD	8				
YO9CYD	36	YO9DAF	44	OK1KZ	72	OK3CSR	120				
Y33VL*	**2520**	Y35VM	850	OK1LNZ	2	OZ2X	80				
Y21KF	176	Y44PF	144	SM6OOI	108	SP6FAF	64				
Y22UB	60	Y22HF	50	YO3DCO	80	YO3YC	98				
Y36SG	8	Y31CB	40	YO8CDQ	2	YU1KQ	3002				
Y21CL	CHECK	Y21PE	CHECK	Y54VA	7564	Y78SL	780				
Y24XJ	CHECK	Y31JA	CHECK	Y44PF	418	Y24XJ	216				
Y43VL	CHECK			Y36TG	198	Y23DG	196				
				Y57ED	18	Y41ZA/Y36RG	32				
EUROPE SSB											
CT1BOP	574	DJ9ZB	360								

PLEASE NOTE: Changes have been made to the total scores in the Oceania sections due to incorrect interpretation of the rules. This applies to both the CW and SSB sections.

OCEANIA SSB			
C21XX*	**144592**	K1BAZ/DV1	13800
YC5ODQ	5302	9M6AE	7680
ZK1XG	6160		
AFRICA SSB			
CT3BM*	**448**		

VK/ZL RESULTS
CW SECTION

CALL	OPEN	10m	15m	20m	40m	80m	160m
VK2BQQ	188739						
VK2PS	116740	507	1932	1750	8550	5100	960
VK2APK*	645760	1725	**16206**	15438	85250	6900	**1920**
VK2KM	108362						
VK2AIC	13132						
VK2AQF	99684		2160	8307	5550	3900	20
VK2AYD	487039	75	15360	13206	104940	5890	
VK2DID	92070		2352	13800	3640	1980	
VK2SU	3424						
VK3XF	1888			288		1600	
VK3CQ*	**167425**	3	13860	10287	1615	2610	1400
VK3XB	142807						
VK3AMD	3040						
VK4SF					64175		
VK4TT*				**40020**			
VK4XA*	**535040**	**5928**	15708	15561	49610	11280	360
VK4XW	15708						
VK5GZ	20658						
VK5AGX	84189						
VK5ADX*	260984						
VK6AJ*	**258156**		**50430**	13083			
					12455		
VK7RY*	**4219**						
ZL1AIH						31820	
ZL1AIZ*	**451200**		216	4902	106200	**33000**	1120
ZL1BN	37638	1440	1296	792	2900	770	
ZL1BSG	60016						
ZL1IM	23030						
ZL1HV	93891						
ZL2AGY*	**492407**	1716	532	7070	**169200**	9600	
ZL2IN	26550			504	980	1200	
ZL3AGI*	**13885**						1540

SSB SECTION

VK1RJ*	**29900**						
VK1ZF	5720						
VK1RH	3564						
VK2PWI			15042				
VK2VZB	Check	Log					
VK2ABC				1715			
VK2BQS	1632						
VK2AYK				13860			
VK2KA				49			
VK2PS	69015		144	8774		2160	2240
VK2APK*	**300118**		476	10502	40825	8700	1200
VK2MCF	1008						
VK2CXX	59976						
VK2HS/P	9532						
VK2AIC	4350						
VK2WA				1015			
VK3IO*							**12300**
VK3XF			1110				
VK3AKK*	**289883**		32	1731	188330		
						40760	
VK3YH	18054						
VK4OH*	**216784**		19706	71659	400	150	
VK4OD	Check	Log					
VK4NCM	Check	Log					
VK4NEF	53692		7008			10080	
VK4BJD						18270	
VK4XJ	Check	Log					
VK4PJ				35568			
VK4AQD*	**172596**			**78792**	1360	3080	
VK5QK*	**172596**			**78792**	1360	3080	
VK5RK			144				
VK6ANG*	**28733**						
VK6AFW	9367						
ZL1AAS*	**392739**						
ZL1AXB*			**206485**				
ZL1BVK						36600	
ZL1AIZ*				**47175**			
ZL1MQ	54780		1804	5074	1440	1260	
ZL1AF*	**12320**			1628	3600		400
ZL2AFY						40280	
ZL3TX*	**13002**						

Open winners in each call area marked *.
Winners on each band marked *.
Both are high-lighted in bold type.

—Contributed by Brian Beamish VK4AHD
ar

PROFESSIONAL ANTENNAS NOW AVAILABLE FOR THE SERIOUS AMATEUR!

Scalar brand antennas are well known in the government, military and commercial communications markets and are exported to many countries around the globe. Scalar has been in business since 1973 making it the oldest Australian-owned major antenna manufacturer. Early this year the Scalar Group of companies were acquired by Vicom International Pty Limited who are substantially expanding Scalar's activities. The new antenna company is now called Vicom Scalar Pty Limited. We are now able to offer amateurs some of the extensive range of antennas previously only available on the commercial market. Please note that sales are mail order only, cheque or bankcard with order. All prices include P&P for delivery anywhere in Australia. Regards, Michael Goode, VK3BDL, General Manager.

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M12T Stainless Steel ¼ wave, unity gain	$7.33
M22T Fibreglass ¼ wave unity gain	$11.53
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M26T Fibreglass helical 30" 3dB gain	$27.36
GRH/T Ground independent 3dB S/Steel whip	$51.82

70 CM ANTENNAS

M31 Stainless Steel ¼ wave unity gain	$8.74
M45 Flexible PVC covered ¼ wave unity gain	$8.23
M40 Brown Fibreglass collinear 4.5dB	$17.86
OW450 "On-Glass" 3dB kit	$160.48

6 METRES

M60T Fibreglass ¼ wave unity gain	$29.00

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KW15 resonant freq 21.275	$81.00
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W2AU 1:1 balun 2Kw 1.8 to 54 MHz	$81.73
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MB The famous VHF base	$7.51
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MGB High quality Magna (magnetic base)	$86.62
GUTTERGRIP for above bases	$19.79
GUTTERGRIP + OB base + 3.5 metres RG58	$31.51
GUTTERGRIP + MB base + 3.5 metres RG58	$31.51
TWS Coaxial 2 position switch	$83.93
MS Medium duty spring for VHF whips	$23.38
IB base for HF whips	$61.18
IS Heavy duty spring for HF whips	$56.75

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BNC-BNC jumper leads	$1.40 ea
SO239/RCA adapter (model # NC557)	$1.40 ea
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T piece SO239/SO239/PL259 (model # NC560)	$1.40 ea
83-58 solderless PL259	$0.50 ea
T-piece SO239/SO239/SO239 (model # NC559)	$1.40 ea
In-line SO239 socket (very hard to get!)	$1.40 ea
3 pin mic sockets (2 per pack) Model # NC513	$1.40
2 pin mic sockets (2 per pack) MOdel # NC511	$1.40

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Model OW 150

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Frequency	140-174 MHz
Nominal Impedance	50 Ohms
Maximum Power	150 Watts
Bandwidth (1.5:1)	10 MHz

— MECHANICAL SPECIFICATIONS —

Radiators	17-7 Stainless Steel - Copper Clad with Black Chrome Plating
Radiator Lengths	20 inches (50.8 cm)
Mount	ABS Plastic 3¼" x 2" (8.3cm x 5cm)
Connector	Miniature UHF
Cable	RG 58 U, 15½ feet (4.7 M) long with Antenna Connector installed Radio Connector Supplied Loose

- **No Hole**
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- **Rugged**
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- **Small Size**
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Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

VK2 AWARDS

Commencing on January 1, 1988, the VK2 Division introduced a range of awards. It was not long before the first applications were being received. Below is a report on those received by early July.

Bicentenary of Australia Awards 1788-1988: Requirement is to work 200 stations during 1988. For those outside VK2, they have to work 200 VK2 stations. VK2s work any 200 stations.

Alick Pickford VK2EF
April 5 — 200 stations
May 7 — 200 VK stations
June 22 — 200 VK2 stations

John Buxton VK2XJB
June 3 — 200 stations on two metres

Fred Baker VK2YZU
June 3 — 200 stations on six and two metres

Jim Swan VK2BQS
July 11 — 200 stations mostly made in RTTY mode.

National Parks Award
Within VK2 there are at present 66 National Parks, 21 State Recreation Areas and 13 Historic Sites. The award can be worked either from or to the various locations. No time limit. Minimum of 25 locations required.

Peter O'Connell VK2EMU
April 26 — Worked from 25 locations all on 80 metres

David Folkes VK2KHZ
May 27 — Worked to 25 locations

NSW CITIES, MUNICIPALITIES AND SHIRES AWARD
In VK2 there are 30 cities, 32 municipalities and 113 shires. Minimum 25 locations to be worked with no time limit.

Alick Pickford VK2EF
March 25 — 25 mixed locations
April 8 — 25 shires
May 3 — 50 shires

John Buxton VK2XJB
April 20 — 25 mixed locations
David Folkes VK2KHZ
May 7 — 25 shires plus 25s award

Details of the various VK2 awards is available in a printed form. Copies are available from the VK2 Divisional Office. If required to be posted, please include two stamps to cover production and postage. All clubs have a copy of the awards so check with them.

In addition to these awards there are two special series in VK2 during the latter part of this year. The first is the one day award on September 22, using the call sign VI88WIA, for the 70th anniversary of the first radio message between Australia and England.

See the article elsewhere this issue for details.

The other special award is the Bicentenary of Parramatta award, using VI88NSW, for the month of November. Requirements are to work the station at 10 locations in Parramatta.

There will be an article on this in the October issue of *Amateur Radio*.

—Contributed by Tim Mills VK2ZTM

FISK AWARD

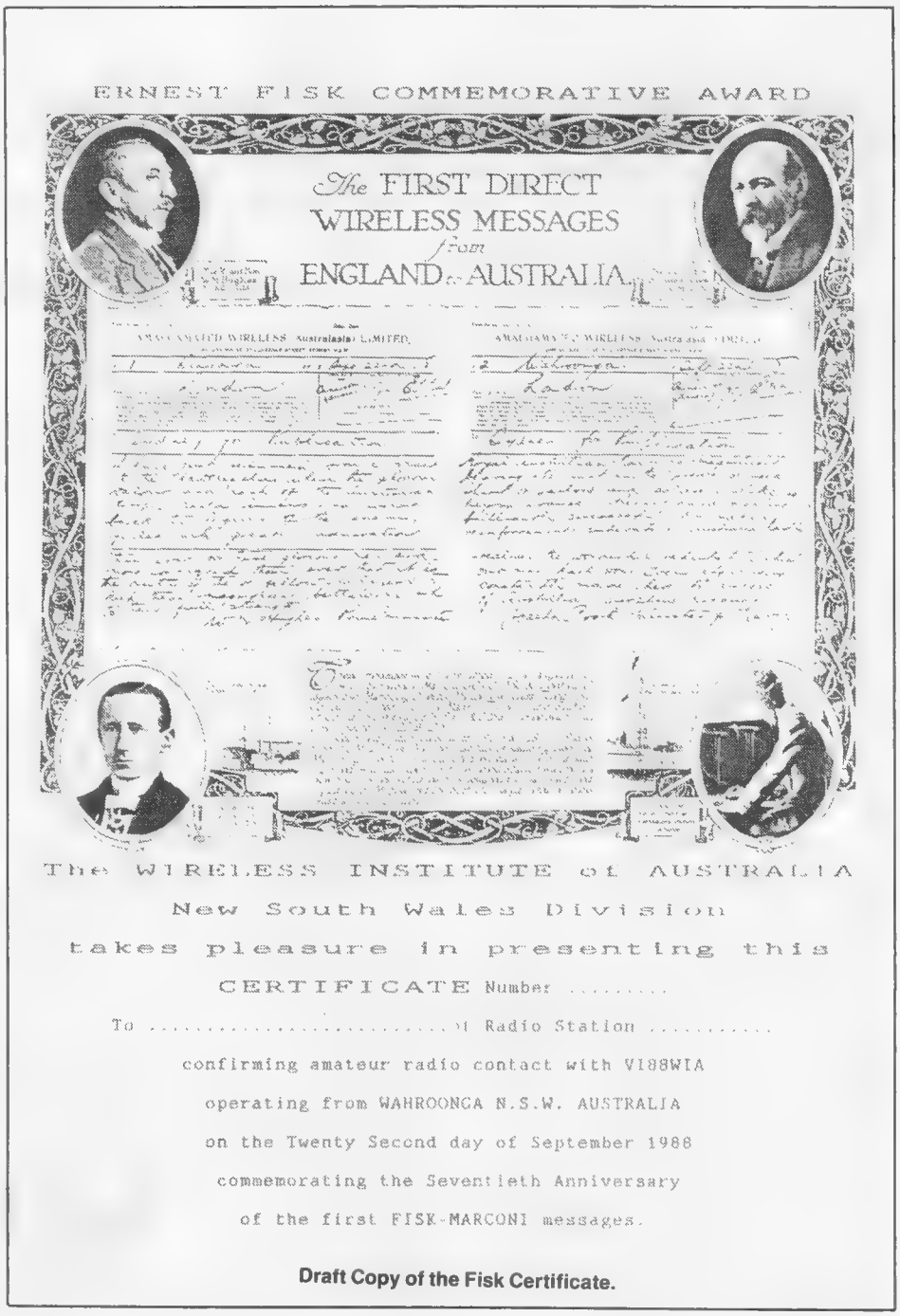
An important and historical event in the development of world-wide communications by wireless occurred on September 22, 1918, when the first closing years of the last century, I had striven to direct wireless messages from England to Australia were received at Wahroonga, 20 kilometres north of Sydney, New South Wales.

This achievement marked both the culminating point in a long period of research and the foundation of those long-distance wireless telegraph, wireless telephone and broadcasting services which today link Australia so efficiently with the rest of the world.

A monument has been erected to establish a suitable lasting memorial at Ernest Fisk's home, "Lucania" 1 Stuart Street, where the messages were received. During the unveiling ceremony, which took place on December 14, 1935, His Excellency The Marchese Marconi addressed the assembly by wireless from Paris.

"Although it is nearly 20 years ago since I directed the transmissions from the high-powered station at Carnarvon, which resulted in the conveyance of the first direct telegraph message to reach Australia from this country, it gives me immense pleasure to be able to take part in your ceremony today.

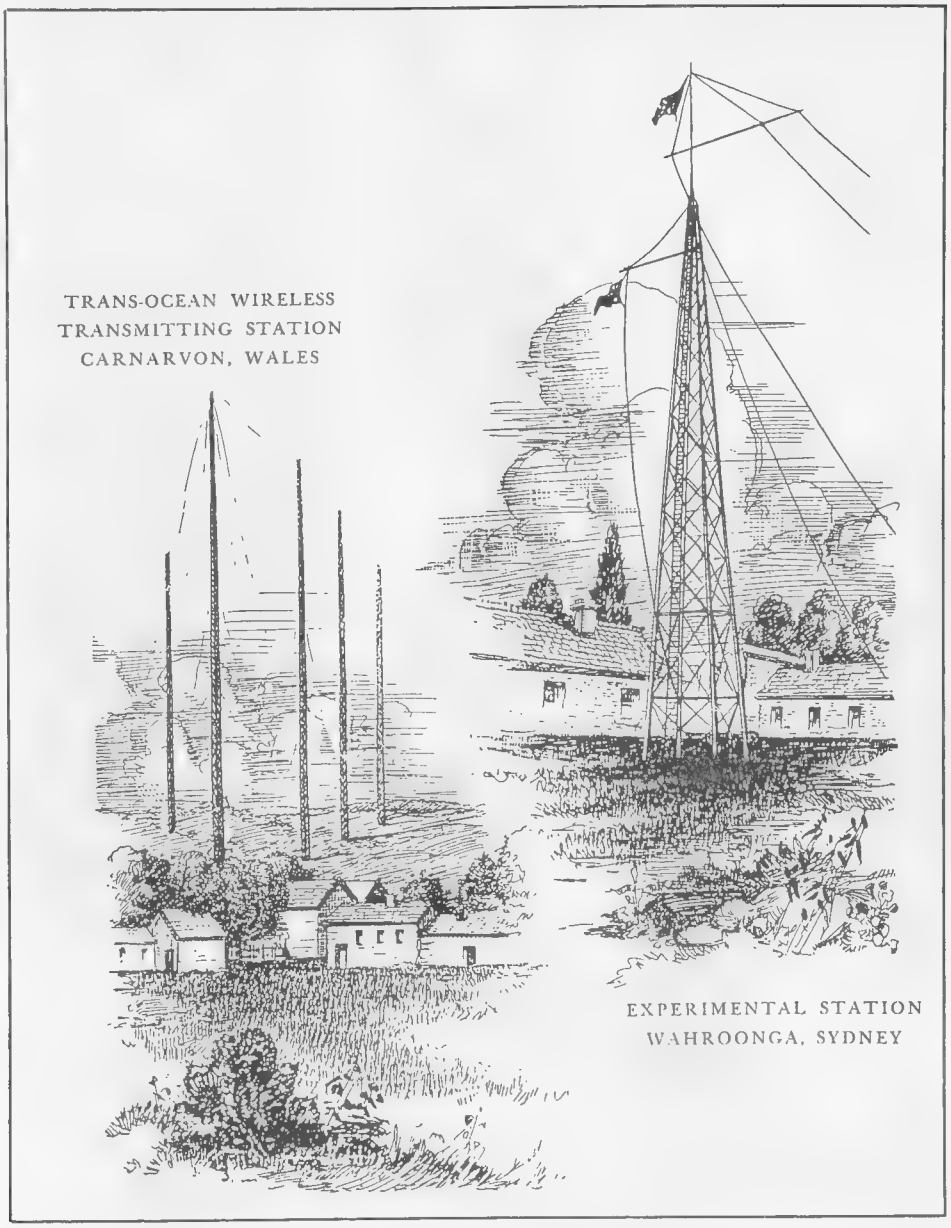
"Over a considerable period, in fact, since the


ERNEST FISK COMMEMORATIVE AWARD

The FIRST DIRECT WIRELESS MESSAGES from ENGLAND to AUSTRALIA

The WIRELESS INSTITUTE of AUSTRALIA
New South Wales Division
takes pleasure in presenting this
CERTIFICATE Number .....
To .....of Radio Station .....
confirming amateur radio contact with VI88WIA
operating from WAHROONGA N.S.W. AUSTRALIA
on the Twenty Second day of September 1988
commemorating the Seventieth Anniversary
of the first FISK-MARCONI messages.

Draft Copy of the Fisk Certificate.



give to the world generally and to the British Empire in particular, improved and cheaper means of communication. Not a little of this time had been devoted to the development of systems which would afford mariners a surer and safer aid to navigation and thereby a larger measure of safety and security for the passengers who travelled with them. My work in the cause of navigation on sea and i air is not yet finished.

"It is natural, perhaps, that I should also have devoted considerable time and research to methods which would bring Great Britain into closer and more intimate touch with its Dominions and Colonies across the seas.

"There were many people, some, I am afraid, of high technical achievement, who discounted my ambitions, but encouraged by the results of my earlier experiments and happily by so many who had followed and appreciated my work, I could not be satisfied until my theories and ideas had been put to the practical test.

"Simultaneously in Australia, my friend Fisk, who is with you today, was conducting experiments with a very similar object in view. In the Autumn of 1918, when I decided to make my first series of tests in an endeavour to reach Australia without the assistance of intermediate stations, I found Fisk in readiness to bring to the experiment the wealth of knowledge and experience that he had accumulated.

"On your monument today is recorded the text of the first radiogram to reach Australia direct, as the result of those first experiments. In shorter time than it takes to read the message, it had covered those 12000 miles or more in its travel from the homeland. Thus was laid the foundation of the speedy and highly efficient system of wireless communication, which today connects you with the capital of your Empire and which has done so much in the interests of commerce.

"Australia is indeed to be congratulated for having still at its disposal the services of so distinguished an engineer as E T Fisk. His skill and research have been of inestimable value in giving Australia and the Western Pacific a system of wireless communication, both telegraphic and telephonic, which is able to take its part on equal terms with other high speed and modern systems in operation the world over.

"In conclusion, may I say that it has given me genuine pleasure to be associated with the unveiling today of the Wahroonga monument to mark the now historic spot which had so important a part in my earlier experiments.

"It is indeed gratifying to me to know that the people of Australia appreciate the extent to which wireless has figured in their commercial prosperity, for without inexpensive and efficient communications no country can make headway."

At the unveiling ceremony The Right Honorable W M Hughes, PC, KC, Prime Minister of Australia, 1915-1923, said that "wireless was a miracle which had opened up a new world far more spacious than that discovered by Columbus. Nothing would do so much to promote international peace as that modern miracle. They should honour men like Marconi and Fisk, who had done so much to perfect that wonderful means of communication."

Ernest Fisk said the ceremony was an indication that his fellow citizens recognised the work he and his assistants did, as being of benefit to the world, and especially to Australia.

In 1901, Marconi sent the first signals across the Atlantic Ocean, without any physical conductor. In 1917, the station at Carnarvon in Wales was opened by Marconi for the purpose of communication between Great Britain and North America. At this time, Fisk and Marconi discussed the possibility of communication with Australia. Scientific men said this was impossible. Experiments lasting many months were conducted at Wahroonga. These resulted, first, in hearing indistinct signals from Carnarvon, and finally, after much research, in the recording of clear and lengthy messages.

The result of those experiments appealed to Mr Hughes, who fought single-handed at the next Empire Conference for direct wireless communication between various parts of the Empire and Australia. He succeeded in ultimately overcoming opposition, and thus enabled wireless to make its great contribution to the social, political and general welfare of the Empire.

Marconi was a great international figure who had taken his wonderful discovery to Great Britain, which was the first country to adopt and develop Marconi's great inventions. In Australia, Fisk was assisted in his experiments by a large number of AWA engineers.

The monument is constructed mostly of Australian trachyte, and comprises a base, die and column surmounted by a globe of the same material. On each of the four corners of the base is a bronze lion to symbolise Great Britain; the globe shows outline maps of the two countries connected by a lightning flash. The whole is surmounted by a bronze figure of Mercury, the messenger of the Gods. The design was conceived and executed by the architect, James Vicars F R A I A.

On three faces of the base of the monument a bronze tablet tells the story.

I.

THE FIRST DIRECT WIRELESS MESSAGE FROM ENGLAND TO AUSTRALIA SENT UNDER THE DIRECTION OF THE MARCHESE MARCONI, FROM THE MARCONI WIRELESS STATION, CARNARVON, WALES, WAS RECEIVED BY E.T.FISK, ESQUIRE, F.INST.R.E., A.M.I.E.(AUST.), IN THE EXPERIMENTAL WIRELESS STATION ATTACHED TO HIS RESIDENCE, "LUCANIA", HERE ON 22ND SEPTEMBER, 1918

II.

THE FIRST DIRECT WIRELESS MESSAGE SENT FROM WALES BY THE RIGHT HON. W.M.HUGHES. P.C.K.C. PRIME MINISTER OF AUSTRALIA:
"I HAVE JUST RETURNED FROM A VISIT TO THE BATTLEFIELDS WHERE THE GLORIOUS VALOUR AND DASH OF THE AUSTRALIAN TROOPS SAVED AMIENS AND FORCED BACK THE LEGIONS OF THE ENEMY. FILLED WITH GREATER ADMIRATION THAN EVER FOR THESE GLORIOUS MEN, AND MORE CONVINCED THAN EVER THAT IT IS THE DUTY OF THEIR FELLOW-CITIZENS TO KEEP THESE MAGNIFICENT

BATTALIONS UP TO THEIR FULL STRENGTH."

The third tablet is dedicated to the people who erected the monument.

On September 22, 1988, to commemorate the 70th anniversary of this great event, an award may be gained by contacting the Special Station, VI88WIA at Wahroonga. The station will be operating for 24 hours only, working UTC time, on 3.570, 7.070, 14.170, 21.170. 28.570 MHz, plus or minus depending on QRM and propagation. Locally the call may be heard on two metres, 70 centimetres and two metres packet (147.575 MHz).

The award may be obtained from one two-way contact. Such a contact is to be confirmed by the applicant's QSL card and a $3 fee within Australia to cover production and postage costs. Overseas costs $A5 or equivalent in US funds. Shortwave listeners will be eligible to receive the award on receipt of hearing one reported contact with VI88WIA plus the appropriate fee.

Applications should be addressed to: VI88WIA, PO Box 600, Wahroonga, NSW. 2076.

—Contributed by Jo Harris VK2KAA, NSW Divisional Historian

HMAS SYDNEY AWARD CERTIFICATE

The Royal Naval Amateur Radio Society, NSW Chapter is introducing an HMAS Sydney Award Certificate 1988 on the occasion of the visits to Sydney by a Royal Naval Fleet, including HMS Ark Royal, with supporting RN ships and a Dutch Task Force led by HNLMS Witte de With. There will be about 40 ships in all in honour of our Bicentennial Year.

The award will feature four HMAS Sydneys of the RAN, commissioned from 1913 to 1988, their histories and battle honours.

Validity: QSOs or SWL reports made, with members of the NSW Chapter of RNARS after September 26, 1988 until December 1, 1989. Member's numbers are required for the award; eg 8888/88 on log sheets or SWL reports.

Two points for a club station and one point for each member.

VK amateurs and SWLs require 10 points, DX stations require six points.

QSOs are to be direct simplex, any amateur mode or band. Endorsements for CW, SSB, etc are available as appropriate.

The award will be of a high quality. Costs: $4.50 for award certificate or five IRCs. Include a self-addressed and stamped 26 x 20 cm envelope for the award which will be protected by the club station for return to the applicant.

Members of RNARS NSW Chapter may be heard on the following frequencies and times (UTC):

3.615 MHz from 1000 to 1130 approximately, Mondays.

3.621 MHz from 0930 to 1030, Tuesdays.

7.020 MHz, 0200 Sundays — plus other times on Saturdays and Sundays.

14.052 MHz daily when the DX bands are open.

Please use standard log sheet format plus members name, numbers and QTH. SWLs standard SWL identified card including both stations worked. Please, do not forget to sign the submission and include your call sign.

Chapter committee decisions on validity and endorsements are final.

—Contributed by Gerry Aubert VK2CGA, Acting Honorary Secretary, RNARS, NSW Chapter

TEN-TEN INTERNATIONAL NET INC "TWENTY EIGHT" CHAPTER

Formed in January 1987, the Chapter announces an addition to the original series of awards offered.

This will be a series of 10 pennants, featuring nine towns of the south-west region and the "Twenty Eight" parrot, the towns featured being:

Augusta, Collie, Margaret River, Bunbury, Mandurah, Pemberton, Busselton, Manjimup and Yallingup.

The Monument at "Lucania".

This will be called "The Southwest Home of the Twenty Eight Parrot".

The basic idea of the awards is to help increase awareness and interest in the south-west region. Although the Chapter has only one member from the south-west at present, there are other members of "Ten-Ten" there and many others who regularly work on 10 metres.

Intended as a fun-event, rules specify that *both members and non-members of "Ten-Ten" can be worked in order to qualify for the pennants.*

However, only members of Ten-Ten may apply for the pennants! (Non-members can use QSOs to qualify for membership and there onward, for Chapter and Awards.

Pennants can be gained in any order, however "The Southwest-Home of the Twenty Eight Parrot must *include* at least one member of the "Twenty Eight" chapter in VK6.

If you live in or are operating from one of the designated towns, you become an "instant qualifier" for any member of 10X worked for that pennant (whether or not you belong to 10X).

Similarly, if you work a station in a designated town (as a member) you will also qualify for that pennant.

Otherwise, by working stations anywhere in the world collect the letters from each QSO to form the names of each town.

You can use up to three consecutive letters from each QSO.

QSOs from June 1, 1988 will be accepted for this ongoing award.

Cost of each pennant is $3 within Australia or US$3 for DX stations. This includes postage which may be adjusted for multiple applications.

For more information, join the weekly net each Sunday after the VK6 WIA broadcast, 0210 UTC on 28.560 MHz, or write to Dave Handscomb VK6ATE, PO Box 1073, Subiaco, WA. 6008.

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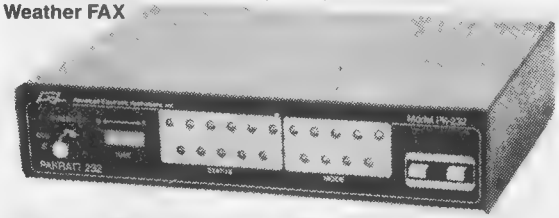

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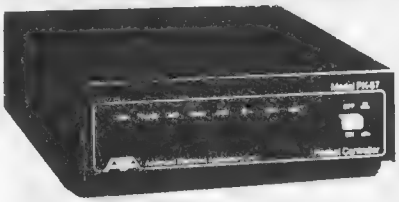

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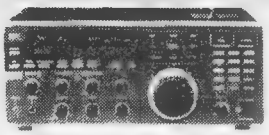

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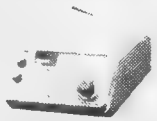

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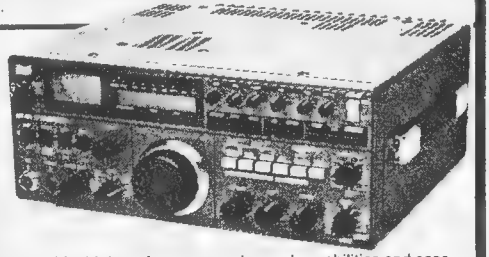

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HF Transceiver specially designed for high performance, enhanced capabilities and ease of operation — features unique to JRC. With general coverage receiver, automatic antenna tuner (optional), two VFO systems, channel scanning, priority check 72 channel memory capacity, digital RIT, several interference rejection circuits and PC remote control capabilities makes the JST-125 one of the three top transceivers on the market.

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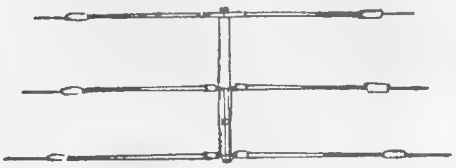
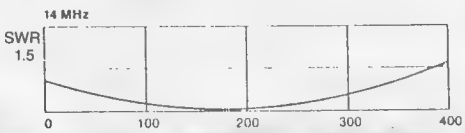
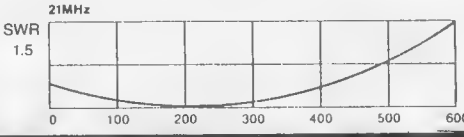
Our new antenna factory "TET-EMTRON" a division of EMONA ELECTRONICS is now producing a range of antennas aiming specially at the export markets of Japan, U.S.A. and Europe.



SPECIFICATIONS:

	HB33DX	HB43DX
Frequency	14/21/28 MHz	14/21/28
No of Elements	3/3/3	4/4/4
Gain (dBd)	8.5/8.7/8.3	9.4/9.5/9.8
F/B Ratio (dB)	22/24/21.5	24/24.7/22
VSWR	1.5 or better	1.5 or better
Power Rating	2 kW	2 kW
Impedance (ohm)	50	50
Element Length (metre)	8.25m	8.25m
Boom Length (metre)	4.0m	6.0m
Turning Radius (metre)	4.54m	5.1m
Wind Surface Area (m²)	0.58m²	0.74m²
Wind Load (EIA STD 80 MPH)	56.7 kg	72.7 kg
Weight (kg)	15 kg	19.2 kg
Price	$580	$480





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Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

Part 2 — Trouble with HiFi, TV and Video Equipment?
by Arno Weidemann DL7AH

Electronic Disturbances
"The legal position, when disturbances occur — tips to overcome disagreements!"

The legal position was explained in Part 1, which should be read first, and the types of disturbances were described. The methods to overcome disturbances were described. The methods to overcome disturbances are now shown, using radio amateur means.

One can make UHF coupling capacitors by using double-sided epoxy printed circuit board (PCB). The typical double-sided 1.5 millimetre thick PCB has 3 pF capacitance per one square-centimetre area. These coupling capacitors introduce only a very small antenna power loss at the second and third television program (UHF IV and V). The insertion loss at program 1 (VHF) amounts to 7-10 dB. Usually the high field strength of the VHF transmissions will permit this order of loss. These conducted current blocking capacitors represent 7 kohm reactance on the 80 metre band. Their high pass effect also results in an improvement of the front end immunity. It is now possible to deal with any other equipment which suffers from insufficient immunity against conducted current disturbances, by further application of the same techniques. The mains plugs of Hi Fi systems (tuner, amplifier, turntable, tape recorder, etc) are all grouped together and plugged into a multi-position mains socket strip. A mains choke as described earlier is placed between the socket strip and the wall socket. The loud speaker cables have RF blocking chokes near the amplifier speaker terminals. Otherwise the cables would act like a dipole antenna (Figure 10). The RF blocking chokes do not affect the Hi Fi sound reproduction quality. The same methods can be used on organs and public address systems.

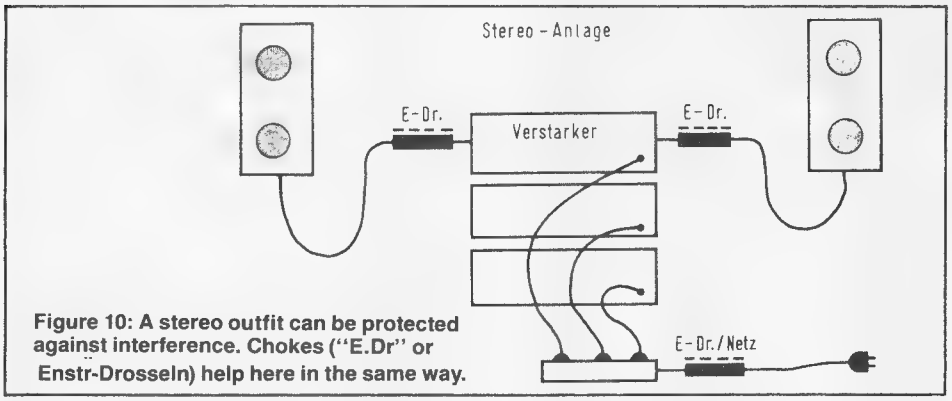

Figure 10: A stereo outfit can be protected against interference. Chokes ("E.Dr" or Enstr-Drosseln) help here in the same way.

Telephone answering recorders are treated by opening the large plug, unsoldering white and brown wire, and inserting two 100-200 uH chokes. These chokes are the size of quarter-watt resistors and cost about DM 1.20. A RF current blocking choke may have to be inserted at the mains cable, if the first measure was not completely successful (see Figure 11).

Older telephones may suffer from disturbance usually caused by demodulation of the unwanted signal by the microphone (a carbon microphone acts like a semiconductor). A ceramic capacitor of 2-5 nF, placed parallel to the microphone (soldered across the fork contacts), usually produces good results.

Inadequate selectivity usually causes inadequate front end immunity. It is always advisable in a collision case to check whether the disturbance is caused by conducted RF current along attached cables, but there are some devices in which insufficient front end selectivity causes disturbance. Insufficient front end immunity is probable if there is insufficient antenna signal selectivity. An especially sad chapter is represented by the army of cheap wideband masthead antenna preamplifiers, which were installed for decades in large numbers. One could not talk about selectivity because of the wideband design! Even the smallest unwanted signals cause overdriving of the receiver and so disturbance is created. There is a simple possibility to overcome the major part of the difficulty. A 10 centimetre long piece of hookup wire (0.1 uH) is placed across the input terminal of the preamplifier — like a short circuit from the coaxial centre to the braid. This wire may be placed like a loop along the coaxial cable (Figure 12). This loop represents a R-L high pass compared with the 60 ohm input impedance of the coaxial cable. Unwanted signals of below 150 MHz are, in fact, progressively "shorted" out. The impedance becomes so high above this frequency that television signals on bands III, IV and V are not attenuated.

Other limit (high pass) frequencies and required inductances can be calculated under the assumption that one metre of free standing wire has 1 uH inductance:

$$f_{gr} = R/2\pi L\ ,\ L = R/2\pi f_{gr}$$

(Gr = Grenze = limit or cutoff). The same method is used on television sets and VCRs. The combination of this high pass wire loop and the conducted current blocking capacitors represents a valuable improvement of the inadequate front end immunity. The wire may be wound up to form a small coil.

The blocking capacitors also act against conducted unwanted signals (see Figure 13).

The resulting reduction of the antenna signal, at lower frequencies (VHF band III), is especially useful in the case of VCRs, because the built-in wideband antenna signal preamplifier often has too much gain, bringing the connected television receiver too lose to the point of being over-driven.

A series tuned L-C circuit is most effective to overcome a two metre (144-146 MHz) transmission disturbance. A coil of eight turns (5 mm id) and a series connected trimmer capacitor of 3-12 pF (Figure 14) is placed behind the blocking capacitors. The photograph, number 15, shows this east t make arrangement. The tuning up is done with the help of a two metre receiver. The wave trap is placed between the antenna and the receiver, a steady two metre signal is tuned in (repeater etc)

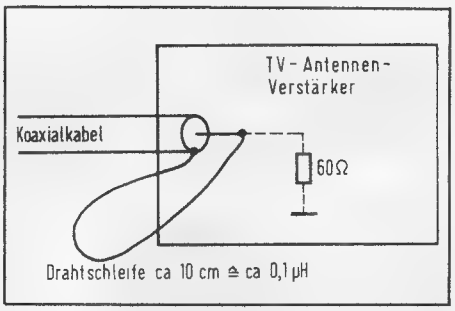

Figure 12: A piece of wire as a high pass filter. A suppression possibility for wide band antennas or receivers.

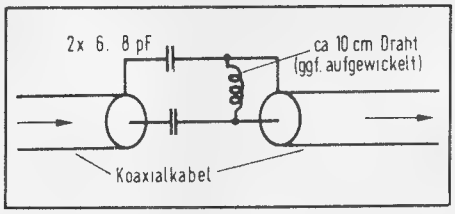

Figure 13: The cutoff frequency of this suppression circuit may be adjusted as necessary. Appropriate for television sets and video recorders.

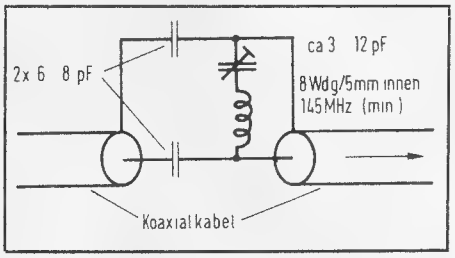

Figure 14: This "suck-out" circuit may be quickly adjusted to the appropriate frequency. Most useful for the two-metre amateur band.

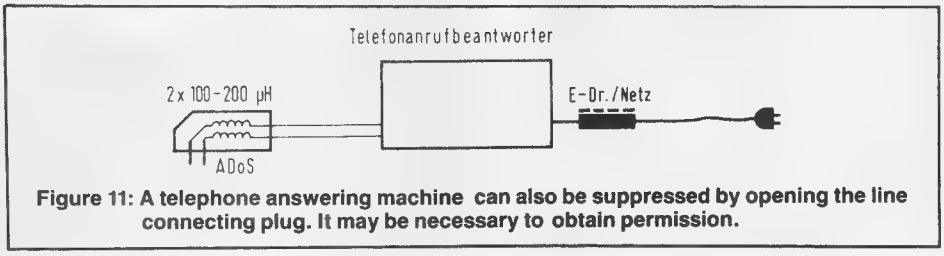

Figure 11: A telephone answering machine can also be suppressed by opening the line connecting plug. It may be necessary to obtain permission.

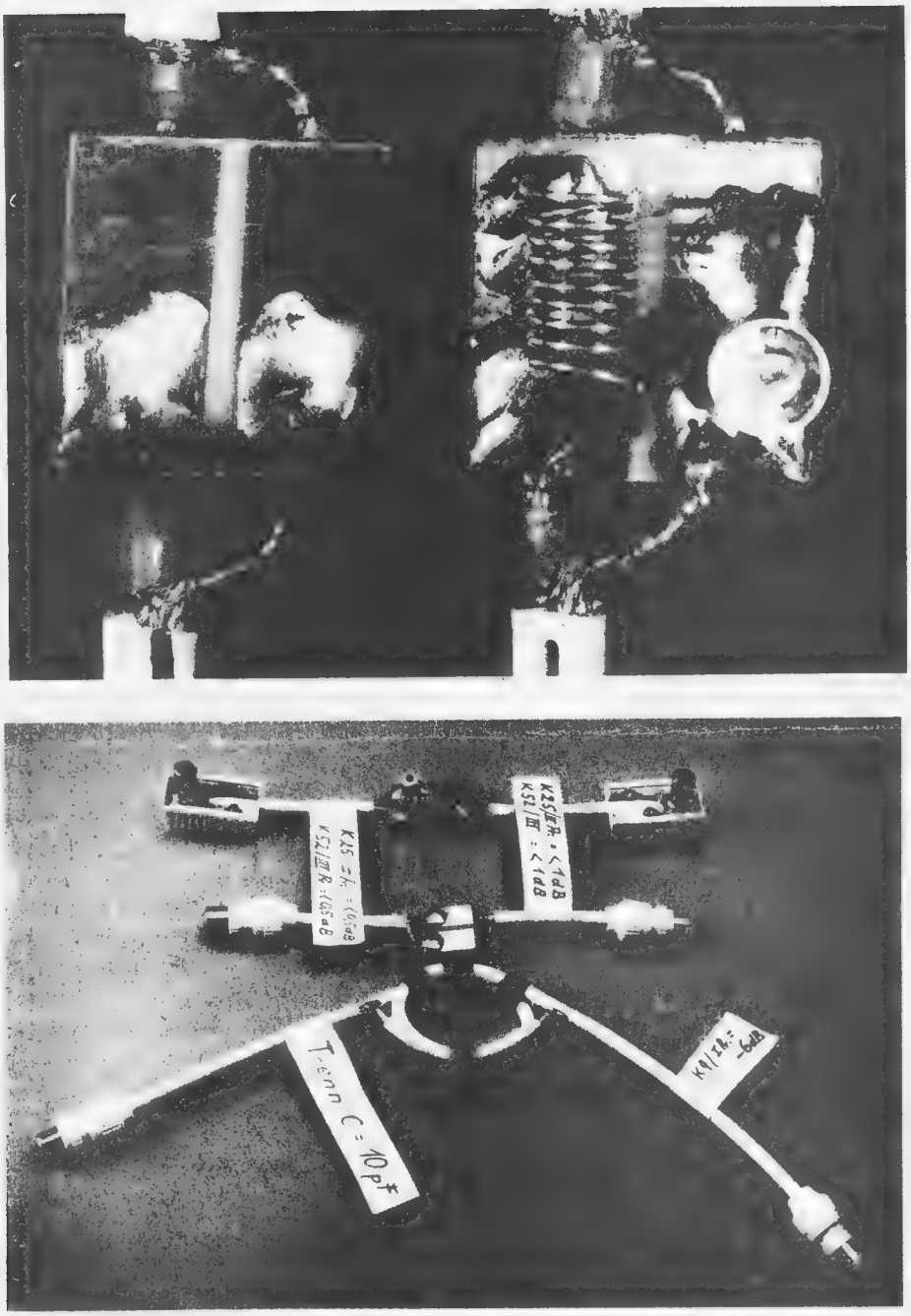

Figure 15: Construction of "suck-out" filters using amateur facilities. Copper-coated board for capacitors. When fitted with plugs and connectors this group of filters permits problem-free experimentation.

and the trimmer is tuned for minimum signal strength. The attenuation amounts to over 40 dB at adequate bandwidth.

Bad shielding — insufficient radiation immunity: Inadequate radiation immunity is an increasing problem as far as disturbances to electronic entertainment equipment are concerned (and not only these). The cost cutting pressures on Far East producers of cheap electronic products (Japan, Taiwan, Korea, etc) even cause the most necessary shielding of circuit groups to be left out. It is therefore not surprising that even small unwanted electro-magnetic fields are enough to result in a disturbance penetrating the non-metallic unearthed cabinet. A disturbance is "pre-programmed" if a correctly operated (legal) transmitter is in the neighbourhood of a VCR for example, which uses the frequency range of 0 to about 8 MHz, and if the equipment function requires a very high gain amplifier (Figure 16).

More than 90 percent of all VCR disturbances are not caused by amateur radio transmitters, but by local high power radio stations operating on long, medium or shortwaves. Only well designed or later improved video recorders can be used within an area of up to several thousand square kilometres around a medium wave transmitter. The other VCRs suffer from conducted current effects, and direct radiation pickup by the rotating video head components, and/or by other front end elements, causing substantial distortion on play back. The colour reproduction is mainly affected, according to the frequency distribution, by transmitters working below 1 MHz (for example long and medium wave radio transmitters), whilst transmitters near 1.5 MHz or shortwaves affect mainly the black/white (luminance) signal. The input circuit of the play back amplifier in most VCRs is tuned to about 5 MHz, to compensate for the otherwise falling response. The resulting resonance increase, combined with the necessarily high amplification of the play back channel, makes good shielding necessary. VCRs on the market from Philips, Grundig, Akai and Sharp, prove that this can be done at low cost. Even amateur radio transmitters, operating on 80 and 40 metres close to the 5 MHz input resonance of the VCRs, do not affect these recorders in spite of close proximity. More and more customers understand the term "Electro-Magnetic Compatibility", which results in the well-designed recorders catching the larger share of the business.

How can one overcome the picking up of unwanted radiation by a badly designed VCR? We have come back to the earlier explained Xray look at a house, to understand the direct radiation pick up correctly (see previous instalment). The metal cables and pipes not only carry the received antenna current, but depending on the length, resonance effects may cause a voltage increase also, as occurs with transmitter antennas. A VCR with inadequate shielding is affected by unwanted RF which is re-radiated from a mains cable installed inside the wall. The same can happen from central heating and water pipes, telephone cables, etc. This is the only way to explain why a VCR is affected (disturbed), when connected to one power point, and not if connected to another power point, perhaps closer to a transmitter antenna.

A simple test demonstrates the possibilities. The VCR is pulled forward as far as the cables allow, while operating in play back mode. Do not hold the equipment in the hands. One could turn the VCR around by 90 degrees, to see if the disturbance can be even more reduced. A different place in the room for the recorder could also be tried. Only complete shielding of the VCR remains, if results so far are still unsatisfactory. A correctly made and good looking metal shielding box is the only alternative. The size must permit adequate cooling. The VCR, including RF blocking chokes and separation capacitors, is installed in the shielding box, and the disturbance is overcome with near absolute certainty. The costs are a matter for the owner of such a bad VCR. The radio amateur is advised to provide at his own expense at least the demonstration. The radio amateur could use such a case as proof of not being at fault, should similar disturbances occur in his neighbourhood. It would

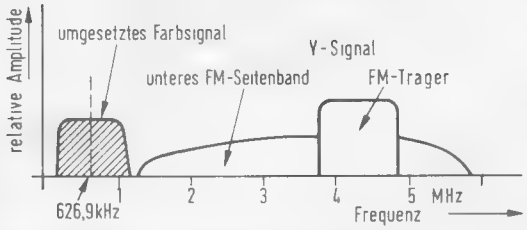

Figure 16: The bandwidth of a video- recorder includes all medium and long wave transmitter frequencies. The only effective solution is screening with a metal case.

help, if the industry could offer such universally useful shielding boxes. Besides the difficulty with amateur transmitters, the disturbance from other correctly operated radio transmitters (over 90 percent) would be eliminated as well. The industry is blamed for selling equipment with "hidden faults" and claims as excuse, that "special local conditions may cause problems". The court cases of the past re "hidden faults" versus inadequate passive immunity have nearly always decided against the manufacturers.

The means shown here of overcoming disturbances were deliberately limited to those which radio amateurs can handle.

The success rate is very good, as experience shows, if it is tackled systematically. There is still the possibility of involving the manufacturer, in a single case where no adequate success was achieved. It is up to the complainant (neighbour) whether he uses this possibility, purchases better equipment or decides to live with the problem. One should advise him, if he intends to purchase a new VCR, to obtain the specific statement on the invoice "has correct immunity" (DIN and VDE Norm: 3V.m). This is also the recommendation of the West German Post Office.

—Paper prepared by Arno Weidermann DL9AH and Klaus Roggenkamp DK3HA

LITERATURE:

1. Professor Karl Tetzner: Radio Amateurs also in Manager Positions, *Funkschau* 13/1984, p 35.
2. Clear picture and clear sound. Information sheet of the Federal German Post Office. 8/1979.
3. Reception disturbances treated at the root. *Funkschau* 11/1986, p 44.

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I have recently had letters from a couple of amateurs charged with setting up the examination systems in their States. It is good to hear that the organisation is beginning to develop. I fear we are all still feeling our way in this matter, so I am making another of my regular pleas for information and input.

I estimate that there are probably between 10 and 30 groups or individuals who are hard at work preparing papers for approval, establishing examination protocol, finding suitable locations, applying for accreditation and completing vast amounts of paperwork.

Since I am a naturally lazy person, all this duplication or multiplication of effort seems to me to be unnecessary. Of course some of the arrangements will be specific to a particular group, but there must be room for sharing of information, ideas, and worries.

If your first examination runs like clockwork, please let the rest of us know how you did it. If it is a complete shambles, please let us learn from your mistakes when you have worked out what went wrong.

I expect that the examiners will fall into two groups — those who are setting up to run regular examinations or provide materials for a number of venues, and those who wish to run a "once-off" to suit a particular group of candidates.

Those working on the larger scale, of course, have more opportunity to polish up their techniques as time goes by. The 'occasional' examiner may need more help and advice.

If we are serious about encouraging new recruits into the hobby, we must be sure that they can enter, ie examinations must be available and the availability should not be less than it was under the DOTC system. This means that provision has to be made for examination in remote areas as well as in the main population centres, in areas with no resident amateurs, as well as in those with active clubs.

It would be pleasing to think that each Division will be in a position to look after all applicants in their area by March 1989, but I cannot be confident that they will. There a much to do, and limited time and resources. In most cases, there will be heavy reliance on volunteers.

I would like to see the development of a strong network among those involved in examinations. The Department accepts that once an examiner has five papers approved they may be re-cycled on a random basis. Can we take this a stage further and provide a 'pool' of approved papers to be shared among all Divisions as required?

I have asked previously for collection of statistics relating to individual papers and examiners. I am prepared to act as a central register for these, also for information about times and locations of examinations so that inquiries can be directed appropriately. Once you decide to arrange an examination, you are obliged to notify DOTC of the arrangements. Please also notify your Division and the Federal Office of the WIA.

Another point that arises is the question of fees for examinations. While few of us see the examinations as a source of revenue, most agree that the Institute should not be required to absorb the costs involved. It would be preferable to establish a rate that is fairly uniform, at least for examinations run under the auspices of the Institute. I see a set scale for papers, tapes, etc produced for the examinations, with the need in some situations for a fee to cover the cost of local supervisors or hire of rooms or facilities.

Most remote candidates will be prepared to make this type of arrangement if it means they avoid a trip to a major centre.

We investigated costs in some detail when the devolvement proposals were being discussed. The estimates produced are available in the 'package' presented to the 1987 Convention. Divisions and Divisional Councillors should have copies which could be used as a starting point.

To conclude, please find time to let me know what you are planning. Unless you specifically ask me not to, I will circulate this information to the others involved in the hope that we can all save ourselves some effort and time, and can work together to build an efficient, time effective system. I look forward to hearing from you all.

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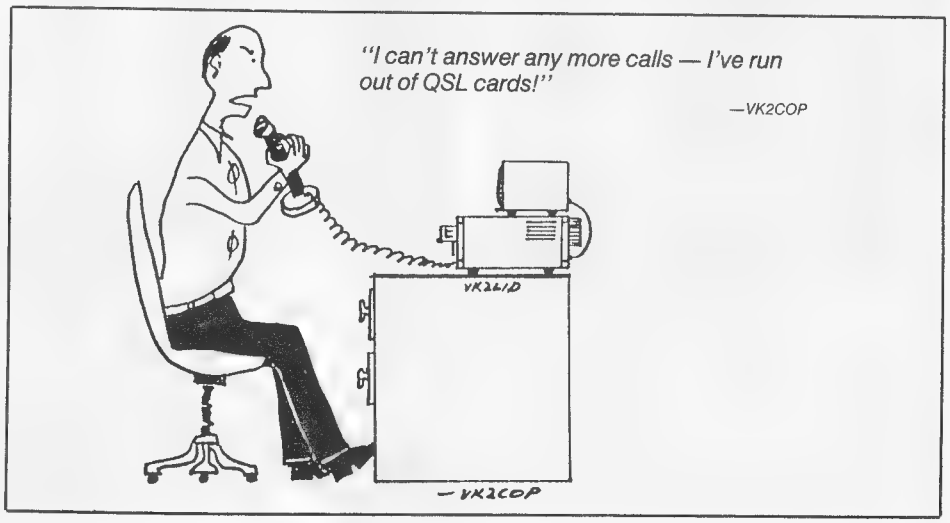

QSLs from the WIA Collection

Ken Matchett VK3TL
776 Warburton Highway, Seville, Vic. 3139

VP3VN

This QSL card from what was then British Guiana, employed a prefix now replaced by 8R. The call sign allocation VPA-VSZ was assigned to "British colonies and protectorates" and became effective after January 1, 1929. Amongst the first countries in that year to take up the new set of prefixes were Kenya, Northern Rhodesia and Straits Settlements. These were quickly followed by British Guiana using the VP3 prefix which it held until the colony became independent in 1966, changing its name to Guyana. For four years it retained a Governor-General appointed by the Queen but became a republic within the Commonwealth in February 1970.

8R1P

Dated March 1967, this was one of the earliest QSLs showing Guyana's new call sign. It also displays Guyana's national flag. This is green (to the right of the flag) with a yellow triangle coming in from the left. A smaller red triangle on the left is super-imposed on this. The green colour represents Guyana's agriculture and forests (the dominant vegetation type is equatorial rain forest) the yellow, Guyana's mineral resources (mainly bauxite) and the red, the country's zeal in building the nation. The country itself is rather small; in fact slightly less in area than the State of Victoria, its whole population not exceeding that of the City of Perth.

The QTH on the card is given as Georgetown, which is the chief port and capital of the country, almost all of the population being centred in and around this coastal city.

WB6MID/8R3

It would be true to say that the majority of QSLs we receive bring joy; this one is associated with a tragedy so great that it made world headlines. The QSL shown depicts an area of furrowed land with a rising sun on the horizon, presumably symbolising hope. The shape of the land and the cloud together cleverly make up the shape of the country itself.

The station belonged to Al Touchette, the radio operator for the Peoples Temple Agricultural Mission. Although its purpose (as stated on the reverse side of the QSL) was "to assist the Guyanese Government, to feed, clothe and house its people and further the human service goals that have characterised Peoples Temple for many years", it was regarded by many as a religious cult, led by the American Jim Jones who established the commune at Jonestown near the Venezuelan border. At the time of operation of its amateur radio there were several complaints to the FCC concerning alleged violations of the amateur code by the station together with threats and counter-threats, so much so that at one stage the FBI was called in to investigate. Be that as it may, there was no doubt that the commune depended greatly upon this amateur station for its communication out of Guyana to the US, particularly when one remembers that Jonestown was a very isolated community situated far west from Georgetown.

This QSL was for a QSO in late September 1978, not long before the tragic suicide of over 900 members of the group, mostly of cyanide poisoning. Al Touchette was one of the unfortunate ones; he died together with his wife and small child.

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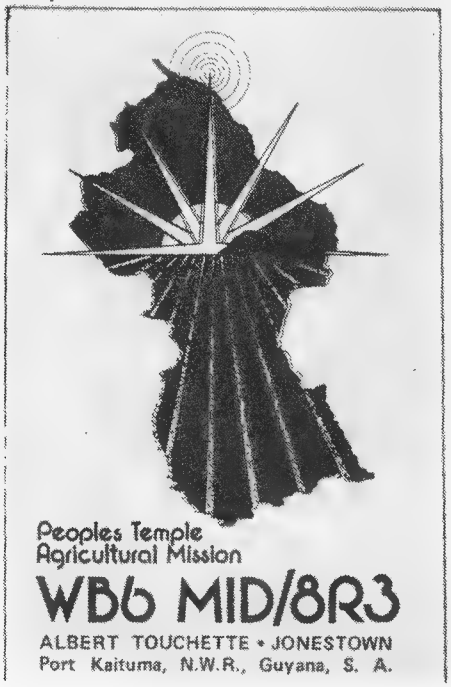

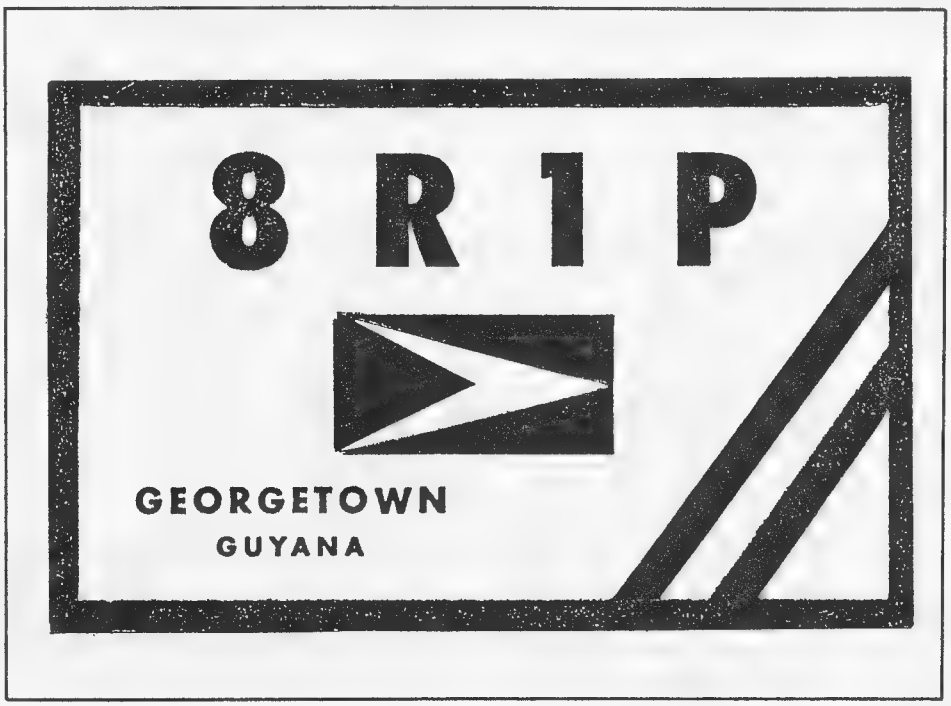

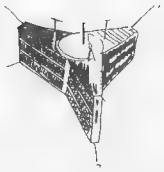

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR

INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC Sunday
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SW PACIFIC
2200 UTC Saturday
Frequency: 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements, from the AMSAT Australia net. This information is also included in some WIA Divisional Broadcasts.

AMSAT OSCAR 13 NEWS COLLECTIVE

The following assortment of news items is an historic record of the recent events relating to the launch of OSCAR 13 and the two successful firings of the kick motor. Congratulations to the AMSAT-DL team for a tremendous team-effort.

HR AMSAT NEWS SERVICE BULLETIN 177.01 FROM WA2LQQ WARWICK, NY — June 25, 1988 TO ALL RADIO AMATEURS BT

AMSAT ground controllers have successfully fired AMSAT OSCAR 13's kick motor in orbit. The result is a successful intermediate orbit one or two steps away from the final, desired AO-13 orbit. A second kick motor firing could come within a week setting the stage for general communications operations in a few weeks.

After reviewing the AO-13 attitude and spin rate, DJ4ZC gave the okay for a kick motor firing last Wednesday. The firing took place at 1857 UTC, Wednesday, June 22. The burn coincided almost exactly with apogee of orbit number 16. The IHU was loaded with a firing routine for a 50 second burn by AO-13's 400 Newton bi-propellant kick motor.

Prior to the burn decision, criteria has been established to manoeuvre to an attitude, in Bahn co-ordinates, of 90 degrees longitude and -60 degrees latitude with an angular velocity (spin rate) of 30 to 40 RPM. However, looking at various considerations, such as the overall schedule and visibility of the satellite over the next week, the decision was taken at about 1630 UTC to execute the burn two and a half hours later. Estimated attitude and spin rate of AO-13 at the time of the motor burn were found to be within tolerance for a burn and so it was executed.

According to an analysis by Phil Karn KA9Q, the change in AO-13 velocity due to the kick motor burn was 159.6 metres per second. This value is about 14.4 percent higher than the 139.5 metres per second predicted from W4PUJ's figures for spacecraft mass, motor performance, and propellant flow rates. Based on the direction of the delta-velocity vector, the attitude of the spacecraft in pre-burn Bahn co-ordinates was:
longitude 66.7 degrees (versus 75 predicted) and latitude 57.7 degrees (versus 55 predicted).

The difference is well within the uncertainty range predicted by DJ4ZC, Karn said.

"Bahn co-ordinates" is a special co-ordinate system based on the orbit of the spacecraft and will be addressed in an upcoming Amateur Satellite Report newsletter.

Apparently the performance of the kick motor exceeded expectations in terms of thrust. KA9Q points out the delta V on AO-10 was also larger than predicted (by about 11 percent), even after the longer burn time due to the Liquid Ignition Unit (LIU) wiring error was taken into account. According to Dick Daniels W4PUJ, the flow rates for both spacecraft were measured on the ground in the same fashion using isopropyl alcohol in place of real propellants. The difference in viscosity between alcohol and the actual propellants could easily account for increased flow rates (and thus increased thrust) on both spacecraft.

KA9Q points out this data is important since they "calibrate" the motor's actual performance, helping plan the next manoeuvres more accurately.

HR AMSAT NEWS SERVICE BULLETIN 177.02 FROM WA2LQQ WARWICK, NY — June 25, 1988 TO ALL RADIO AMATEURS BT

The AO-13 kick motor burn was the second in-orbit burn performed by any AMSAT spacecraft but the first fully successful one. AO-10's first and only motor burn in 1983 was longer than planned due to a hardware problem. Perigee rose to 3900 kilometres versus the desired 1500 kilometres as a result. Later, due to a Helium leak through a seal, a second burn was found to be impossible.

Last weeks AO-13 kick motor burn, on the other hand, went perfectly with no deviations except for the higher than expected kick motor performance.

Telemetry indicates the pressure loss experienced on AO-10 has not recurred with AO-13. Telemetry channels 09 and 0D in particular confirm the satisfactory performance. Channel 09 (Helium high pressure) was at about 735 Bars and Channel 0D (Helium low side pressure) was about 14 Bars.

Further refinement of AO-13's orbit should now be possible. A second and possibly a third burn can be accomplished whenever the required attitude manoeuvres are completed.

HR AMSAT NEWS SERVICE BULLETIN 177.03 FROM WA2LQQ WARWICK, NY — June 25, 1988 TO ALL RADIO AMATEURS BT

AMSAT's team of ground controllers has begun precise ranging of AO-13 in order to determine its new orbit after the first kick motor burn accomplished last Wednesday. The result is a set of successively more accurate orbital element sets. The data has proved sufficiently accurate to be adopted by official government satellite tracking agencies.

AMSAT's orbital determination process begins with range measurements from various command stations using round trip delay time measurements from the earth to the satellite and back. Stations making such measurements at present include KA9Q, DJ4ZC, DB2OS, ZL1AOX and VK5AGR.

Once the range data is acquired, a complex number-crunching process begins. A Keplerian element set results which is then checked for "fit" with other tracking data and with AOS/LOS observation reports.

HR AMSAT NEWS SERVICE BULLETIN 184.02 FROM WA2LQQ WARWICK, NY — July 2, 1988 TO ALL RADIO AMATEURS BT

All the telemetry indications from AMSAT OSCAR-13 show this to be a healthy satellite. Power generation is excellent and temperatures are all within expected ranges. The main battery temperature is hovering between 12 and 13 degrees Celsius and the two metre power amplifier is running at a comfortable 16 degrees Celsius. The coldest reading monitored is in the Mode S transponder which is not currently activated. It is indicating a nominal six degrees Celsius. In general, all temperatures lie in a range of six to 19 degrees Celsius.

AO-13 telemetry is transmitted in three forms: phase shift keyed (PSK); RTTY; CW. The RTTY uses frequency shift keyed (FSK) tones spaced 170 Hz at a signalling rate of 50 baud. RTTY telemetry is sent at 15 and 45 minutes past the hour. CW telemetry is sent at 10 words per minute at 0 and 30 minutes past the hour. PSK telemetry is sent at other times at 400 baud. The Mode B General Beacon is at 145.812 MHz. Telemetry reception in many areas has been hampered by FM users many of whom are unaware 145.800 to 146.000 MHz is, by general agreement, a sanctuary for weak signal, satellite operations.

There are 64 channels of telemetry sent in PSK. The first 60 of these are sent in RTTY as well.

Telemetry indicated effects from the huge solar flare last Saturday, June 25. By Sunday, those monitoring AO-13 telemetry had already detected "hits" in the satellite's computer. Although no damage was expected and none occurred, the intense burst of radiation from the sun registered on AO-13 when its self-correcting devices were obliged to correct for radiation-induced errors in the IHU. These were seen as memory "soft errors" meaning a temporary upset caused by radiation had occurred. The AO-13 IHU and memory are extremely radiation resistant, at least a thousand times more than AO-10, and so the radiation hits are of academic interest but pose no real threat to its health. Watching the hits can, however, give an idea when solar radiation and particles arrive in the vicinity of earth.

TO ALL RADIO AMATEURS BT

With the second and final kick motor firing now slated for this coming week, potential users are awaiting word on when the new bird will be available for use. With things going extremely well in all aspects, the answer could be more sooner than later.

According to reliable sources, once the second and final kick motor burn is accomplished, it will take about two weeks to re-orient the satellite and spin it down to about 30 RPM for general operations. Thus, if the motor burn occurs later this week, AO-13 could be released for use beginning in late July.

A detailed operating plan for AO-13 will evolve after initial operations commence and will be based on operating experience including use levels. Initially, Mode B will be used almost exclusively with Mode JL used in modest proportions. Then, depending on use patterns, Mode JL use, especially around apogee will be gradually increased. After a certain period, Mode JL operation will likely predominate the operating schedule in order to take maximum advantage of its broad bandpass. Moreover, Mode JL will straddle apogee to take advantage of the high gain, narrow beam 24 centimetre helix on the satellite. The high gain antennas will be pointing directly at the geocentre when at apogee once the spacecraft is properly oriented.

The narrow, 50 kHz, two metre J uplink in the 290 kHz Mode JL transponder, is intended primarily for and recommended for Third World uplinks.

HR AMSAT NEWS SERVICE BULLETIN 188.01 FROM WA2LQQ WARWICK, NY — July 6, 1988

TO ALL RADIO AMATEURS BT

ALINS.011 SPECIAL FLASH REPORT
New OSCAR Successfully Manoeuvred in Historic Move

For the first time in history, amateur radio has a new satellite in the right orbit for long-duration DX communication on the amateur bands. AMSAT OSCAR-13 was successfully inserted into its final operational orbit late Wednesday, July 6. This was the second and final orbital manoeuvre performed by the 142 kilogram (312 pounds) spacecraft.

Launched as AMSAT Phase 3C aboard Ariane 4 on June 15, the satellite became AMSAT OSCAR-13 (AO-13) the same day upon its insertion into orbit. A week later, on June 22, AMSAT engineers started the on-board rocket engine for less than a minute to test the various systems and change the initial orbit slightly.

The rocket motor operation on July 6, was a "go-for-broke" effort where a major orbital change was accomplished and all remaining propellant fuel was consumed. The final manoeuvre performed Wednesday had the effect of raising the perigee (low point of the orbit) from about 1100 kilometres (683 miles) to about 2400 kilometres (1490 miles) and of raising the inclination from 15 degrees to 58 degrees. The apogee (high point of the elliptical orbit) was essentially unchanged at 36 000 kilometres (22 360 miles).

The 5.5 minute rocket engine "burn" began at 2105 UTC, July 6. The burn added about one mile per second to AO-13's orbital velocity. Early indications were the new orbit was right on target, AMSAT sources said. All telemetry from the satellite was nominal and the satellite remains a very healthy "bird" in the jargon of space aficionados.

A few steps remain before the satellite will be made available for general operation by the amateur radio community. Precision tracking will accurately measure the final orbit, re-orientation to the correct attitude for communications operations and final transponder check-out are all that remain. This should be accomplished before the end of July, AMSAT officials said. AO-13 employs communications transponders ranging in frequency from two metres through to the 13 centimetre band. In its final orbit, similar to an orbit frequently used by the Russians called "Molniya". AO-13 will provide up to 18 hours coverage per day. Because at apogee it is as high as a geosynchronous communications satellite, it will cover a hemisphere at a time.

Because of its inclined orbit, users will be able to easily work "over the pole" a feat not acheivable on geosynchronous satellites. VHF/UHF QSOs to DX areas such as VU, AP, 9V and YB are at hand! These have never before been regularly possible on any prior satellite but they are about to become a daily occurrence on AO-13.

OSCAR-13 STATUS REPORT 7/7/88
Status report from AMSAT-DL Marburg/ West Germany on July 7, 1988

1. On July 6, 1988 at 2106 UTC, the second and final motor burn was performed for six minutes to change the orbit inclination to 57 degrees. Motor performance was nominal and the orbit is now expected to have a perigee of 2500 kilometres.
2. During the next several days the newly achieved orbit will be measured using ranging techniques to obtain the correct Keplerian elements for the new orbit. The exact parameters will be available around July 10.
3. After determination of the new orbital parameters, the orientation of the satellite will be changed during the following week to aim the antennas to the earth.
4. Since the engineering phase has proved so smoothly, the satellite will be released for general use as early as July 20, instead of August 1, as was originally scheduled. Initially Mode-B (70 centimetre uplink, two metre downlink) will be put into operation.
5. The operational schedule for the transponders is expected to be as follows (subject to change as needed):

Transponder	Mean Anomaly in 1/256
OFF	MA225 . . . MA 30
Mode-B	MA 30 . . . MA 98 and MA158 . . . 225
Mode-L	MA 98 . . . MA158 (daily)
Mode-JL	MA 98 . . . MA158 (weekends only)
Mode-S	(due to sun-angle, Mode-S operations will probably occur in September, when the antenna will point at the earth)
RUDAK	during Mode-L operations

73 The AMSAT-DL team

AMSAT-AUSTRALIA NEWSLETTER

This fine monthly publication published on behalf of AMSAT-Australia by Graham VK5AGR, now has 200 plus subscribers. Should you also wish to subscribe then send a cheque for $20 made payable to AMSAT-Australia and post to:
AMSAT-Australia, C/- PO Box 2141, GPO, Adelaide, SA. 5001.

The Newsletter provides the latest news items on all satellite activities and is a must for all those seriously interested in amateur satellite activities.

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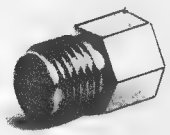
Who Said SMA Connectors Are Expensive .... ??????

Whoever it was obviously didn't ask us. Our range of SMA connectors and accessories are not only good value, they work well too.

SMA Loads

A recent survey by us found that in small quantities SMA 500mW terminations are selling for $78 to $135 each in Australia. Why?.. Well we don't know because the EMC range of SMA loads (they are among the best in the world) are selling for nothing like these prices at Stewart Electronics. Best of all they are available NOW from STOCK from us in Melbourne.



TC17 ... 1 watt FEMALE LOAD
$58.60 + 20% sales tax

Pd	= 1W (DC - 18GHz)
Freq.	VSWR
4GHz	<1.05
8GHz	<1.12
12GHz	<1.15
18GHz	<1.20

TC19 ... 1 watt MALE LOAD
$32.36 + 20% sales tax

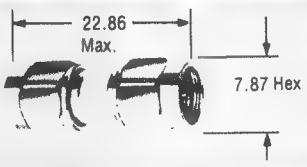
Pd	= 1W (DC - 18GHz)
Freq.	VSWR
4GHz	<1.05
8GHz	<1.10
12GHz	<1.15
18GHz	<1.20

TC18 ... 2 watt MALE LOAD
$46.90 + 20% sales tax

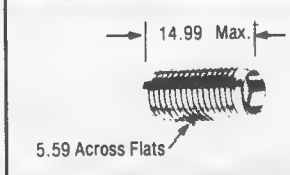
Pd	= 2W (DC - 18GHz)
Freq.	VSWR
4GHz	<1.05
8GHz	<1.10
12GHz	<1.15
18GHz	<1.25

SMA Adaptors

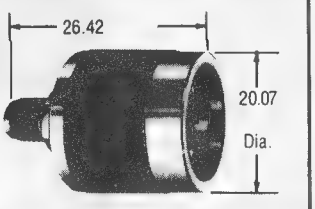
As more and more equipment starts to use the 3mm or SMA connector we need adaptors to interface with existing equipment. These American made adaptors offer excellent quality at reasonable prices.
We also stock a large range of SMA, SMB & SMC connectors and Semi Rigid Co-Ax cable to suit please send for a full listing post free.



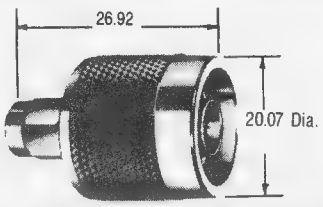
PC67 SMA F-F
$30.96 +20% tax



PC66 SMA M-M
$36.25 +20% tax



PC58 SMA M to N Male
$78.98 +20% tax



PC59 SMA F to N Male
$75.17 +20% tax

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SATELLITE RECEIVING CONVERTER

With OSCAR-11 now in orbit, the Moorabbin and District Radio Club, in a very timely move, have announced the release of another batch of two metre satellite receiving converters.

This converter was first described in the October 1984 issue of *Amateur Radio* as was run by the MDRC as a most successful project, with kits and finished product both being made available.

For further information contact the Moorabbin and District Radio Club, PO Box 88, East Bentleigh, Vic. 3165.

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EMI SUPPRESSION INDUCTORS

Pulse Engineering have developed a complete inductor family to provide a package with guaranteed minimum resonant frequency and leakage inductance limits. These are important parameters to consider when designing on-board filters for high frequency switch mode power supplies.

The wide variety of available component values makes it possible to design a board mounted filter with optimum performance characteristics.

The Inductor Kit has a selection of 31 inductors with rated currents from one to 15 amps. All are tested to VDE 0565 part 2 and UL 1278. Dielectric tests are 3750 Vac (winding to winding).

Complete details of the kit is available from Clarke and Severn Electronics, PO Box 129, St Leonards, NSW. 2065.

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CAPTAIN COMMUNICATIONS NOW SELLING THE WORLD'S ONLY SHIRT POCKET SIZED TWO METRE TRANSCEIVER — the Icom u2A/A

Captain Communications of Parramatta is now stocking the micro-sized Icom hand-held series — the Icom u2A/A. The palm-sized transceiver represents a breakthrough in two metre "go anywhere" technology. Measuring just 4.6" high, 2.3" wide and 1.1" deep, the IC-u2A/A has more features than large transceivers.

Features include:

* 10 programmable memories
* Odd offset capability
* LCD readout
* 2.6 watts output
* 32 in-built sub-audible tones

In Icom tradition, the IC-u2A/A has an extensive range of accessories, including rechargable batteries, carry case, headsets, and even VOX.

Captain Communications stocks the full range of Icom equipment, including amateur, commercial and marine transceivers and receivers. Captain maintains a full technical advice, service, installation and repair facility and is open seven days a week.

For further information on Icom products, call or FAX the Captain:
Phone (02) 633 4333, FAX (02) 891 2271.

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A R Showcase

LIGHTNING PROTECTOR WILL HANDLE 5000A

Schaffner EMC has added a lightning arrester, the SAPN, to its range of RFI suppression and electronic equipment protection devices. It will dissipate transient currents as high as 5000A.

Housed in a DIN rail-mountable package, the module is designed to protect Telecom networks and modems from the effects of lightning induced surges. Although the insertion loss on a 600 ohm line is only 0.14 dB, the SAPN which is designed to operate on 200 volts DC lines clamps at 280 volts for a current surge of 5000 A.

The effect of a typical lightning strike on a communication cable is to produce a pulse of energy typically a few hundred microseconds long and several hundred volts in amplitude. The effective source impedance is very low, so any protection device must be capable of dissipating large transient power levels. This is achieved by diverting the surge through gas discharged tubes in series with sand filled wire wound resistors, so there are no trips to reset after the strike occurs.

To achieve the necessary response time for digital circuits, high speed clamp diodes are employed in parallel with the main diverting element, a doped and fail-safe gas discharge tube. The result is high power dissipation coupled with a rise time of only 15 ns.

These arresters have been approved for use on British Telecom private user circuits and the main PSTN network. They are batch tested to CCITT recommendations at the factory to assure reliability.

For outdoor applications, weatherproof housings can be supplied, each containing one, five or 12 units.

For further information, please contact:
The Sales Manager, Industrial Products, Westinghouse Systems, Westinghouse Brake and Signal Co (Australia) Limited, PO Box 267, Williamstown, Vic. 3016, or phone (03) 397 1033.

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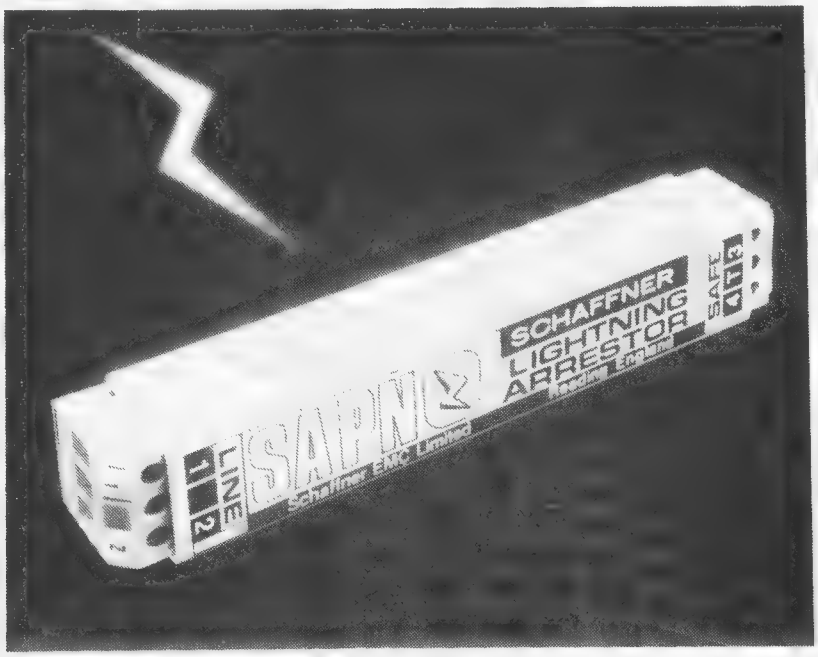
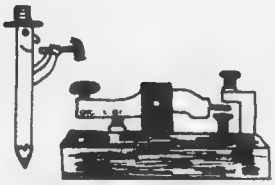




Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright. Vic. 3741

Should radio club instructors aim merely to produce candidates who can pass the DOTC examinations by 'standing on their tiptoes' or to produce new operators who have a flying start towards becoming *good operators?*

This question was proposed by Rex VK2YA, and I thought it should be passed along to all the other Morsiacs as well, especially as we may soon be doing the testing ourselves (or through the WIA). You may have already volunteered to be an official Morse examiner, realising that, at last, the users of Morse will have an important place in the testing of new amateurs. If not, some control of the situation. The following 'revised draft' was evolved from the Youth Radio Service and the New South Wales Education Service conditions, and offers a chance to bring the whole Education Service Award System back into useful prominence.

If you, the Morse user, want control, or even the continuation of Morse code as a mode of communication, you cannot afford to sit back and allow the majority of other operators to put you down through *your inaction.* If you want good operators on the Morse segments of the band you *should* volunteer as an examiner, part time teacher or whatever. Not only will you save money for the applicant and the Institute, you will find a rewarding outlet for your expertise and probably an improvement in your own procedures and results on air in DX, contests or awards. You will make it *easier* for applicants to gain their certificates through your enthusiasm alone, and be able to follow through the examinations with your new contacts, bringing them into the fold as Knights of the Key. Do you think pleasant thoughts about the person who introduced or helped you into Morse code? If you do you will see that, for an investment of some of your time and expertise, you will gain suitably just rewards.

REVISED DRAFT
CONDITIONS FOR THE AWARD OF THE WIRELESS TELEGRAPHY OPERATORS' CERTIFICATES

These certificates may be awarded to members of radio clubs registered with the WIA (NSW) Education Service and to other candidates approved by the Committee of the Education Service who complete the following conditions:

A. MORSE CODE EXAMINATIONS: Candidates must pass tests in receiving and sending Morse code at seven words per minute under conditions outlined in the *Handbook for Operators of Radio Stations in the Amateur Service.* These tests shall be set and marked by approved Volunteer Morse Code Examiners authorised by the Committee of the WIA (NSW) Education Service, provided that such tests may be conducted using cassettes sent by the Education Service and administered by Volunteer Examination Supervisors appointed by the Education Service Committee.

Candidates who pass both receiving and sending tests at seven words per minute may be tested at higher speeds by arrangements made by the Committee, and Certificates may be endorsed with the speeds attained by the Candidates, provided that passes in both receiving and sending must be obtained at the same examination session.

B. SUPERVISED ON-AIR OPERATING: Candidates must have conducted on-air Morse code contacts under strict supervision of licensed Amateur Radio Operators. Where practicable in the case of radio club members, this activity should be part of Morse Code Training Courses for Novices and AOCP candidates. In the case of candidates who do not belong to radio clubs, arrangements will have to be made with the Educations Service Committee.

C. LOG BOOKS: Candidates must submit neat and complete log books to record all supervised on-air contacts made in accordance with Paragraph 2 above. All such entries must be countersigned by the Supervising Operators.

D. OPERATING SKILLS: Candidates must satisfy the Volunteer Morse Code Examiner in a practical and/or written test that they have a sound knowledge of —

i. Making general (CQ) calls and answering such calls;

ii. Tuning receivers for best reception with clear explanations of the functions of the various controls;

iii. Tuning and adjusting amateur transmitters (or transceivers) to give best performance in Morse code mode;

iv. Reporting of readability, strength and tone of received signals;

v. Frequency limits of amateur band segments available to Novice operators in authorised bands;

vi. Australian Amateur Call Sign Prefixes — and common prefixes of other countries;

vii. Operating Procedures and on-air behaviour — avoidance of common unacceptable practices;

viii. Local time and Greenwich Mean Time (UTC) — conversions.

E. REGULATIONS EXAMINATION: Candidates must gain at least 70 percent of the possible marks in a written examination based on the examination topics in the *Handbook for Operators of Radio Stations in the Amateur Service.* In addition, candidates for this certificate must undertake an additional test in operating practices which will include questions relating to the various unsatisfactory practices that are frequently heard on the amateur bands.

F. CERTIFICATES: May be issued in three grades — (i) Grade 3 requires 10 supervised on-air contacts; (ii) Grade 2 requires 20 such contacts; Grade 1 requires 30 such contacts.

NOTES:

(a) The Morse code and regulations requirement are in excess of those required by the present DOTC examinations in theory and Morse code;

(b) It is apparent that many Novices — and AOCPers — receive little or no instruction in the essentials of on-air operating and merely imitate the procedures of the less experienced operators whom they hear on the air. This certificate system will give greater direction to instructions — from the radio clubs and other sources — who seek to prepare new Novice candidates. It is fairly evident that some candidates have never been shown which operating errors to avoid — such as gross over-use of call signs, vain repetition of "73" (three and four times when once is enough), failure to make best use of recognised abbreviations and so on.

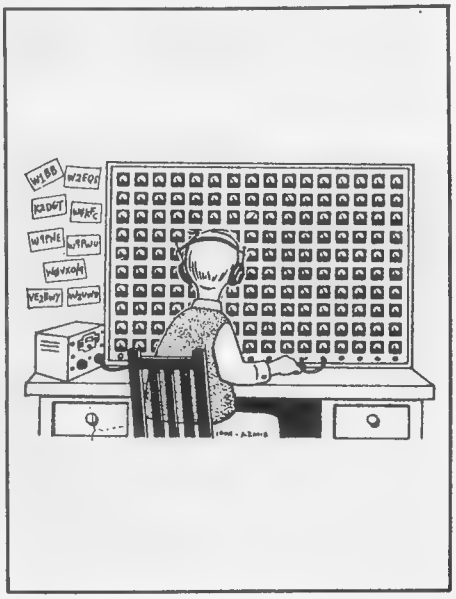
(c) It is evident that some DOTC examiners take little account of the quality of the Morse code sent by candidates. It seems that "as long as they fill the 2.5 minutes, the quality doesn't matter". I submit that poor quality Morse should result in failure. It seems that some Novices have never been told how to hold a key, how to sit, how to use spacing between letters and words. Even many AOCP operators are not above criticism and manage to send code that is practically unreadable.

(d) It is hoped that the opportunity may arise under this projected "development" to submit claims that the holders of the WIA (NSW) Education W/T Certificates should be granted exemptions from the subjects of (i) Regulations, (ii) Morse Receiving, (iii) Morse Sending — on the grounds that our standards are superior to those established by the DOTC.

(e) It is proposed that there should be real testing of common punctuation marks and procedure signals and that part of the testing should include consideration of sample "overs" and detection of mistakes, poor usages and un-necessary wordage. (Morse code is often criticised as being too slow compared with voice operating. It is slower largely because of inadequate training and the imitation of poorer operators by the "new chums". These situations must be changed!).

I have mentioned operating procedures and practice in previous articles, if you are in any doubt about your own procedures I suggest you go back through your ARs and see what you make of yourself. There are too many operators who blunder their way into a contact with a mad contester who has to explain what is going on, quite often at great length with repeats, in order not to offend by disappearing, or to gain points which may mean the contest.

There are operators who talk on for (what seems like) hours when others on a net are waiting to have their say, they only have themselves to blame if they find that the other operator/s have left the shack and missed their over. Am I at fault when I resent finding my time being wasted unnecessarily? The little enough time I have on air needs to be efficiently used in communicating, whether it is a rag chew with one or two mates, serious DXing, helping a beginner at five words per minute, or contesting for 24 hours non-stop. Or should I give it up until I am retired? The horrible thing is that the less time I spend on air, the worse my own procedures seem to get, my sending is atrocious of late because I only spend an hour or so per week in the shack. Heeellllppppp. . .



CENTRAL HIGHLANDS AMATEUR RADIO CLUB

In May this year, a new club for radio amateurs was formed in Tasmania. Called the Central Highlands Amateur Radio Club of Tasmania, it is open to all licensed amateurs who are members of the WIA.

Objects of the club are:

To meet as a group from time-to-time to enjoy and operate portable amateur radio stations in the Central Highlands area; and

To enjoy the company of one another in a social situation.

There are no membership or joining fees. Money is raised for club expenses by fining members for various "felonies"; eg using "Q Code" on phone, sloppy radio procedure, misbehaving on air (or anything else deemed worthy of a fine by the President of the club).

Members meet on air at 7 - 7.30 pm EAST on 3.590 MHz. Net Controller is Bob VK7KZ, using the club call sign VK7CHT. This net is for joining new members (who only need ask to be able to join), discussing future events, and listing members' fines for the past week.

CHARC will be active at London Lakes in the Central Highlands on December 2 and 3, at the World Fly Fishing Championships. Club members will be using VI88TAS on all HF bands. As over 15 countries will be represented in the Championships over that weekend, and heavy media coverage is arranged, it is hoped that amateur radio will get plenty of publicity from the event.

At present the club has 17 members — 16 from VK7 and one from VK3!

For further information contact the Secretary/Treasurer, David O'Brien VK7NDO, 27 Ash Street, Lutana, Tas. 7009 or the Club President, Bob Greeves VK7KZ, 28 Hamilton Street, West Hobart, Tas 7000.

—Contributed by Bob Greeves VK7KZ, President, CHARC

BALLARAT AMATEUR RADIO GROUP INC

The Ballarat Amateur Radio Group Inc held its Annual General Meeting on June 24, 1988. Executive officers for the coming year are:

President — John Hazledine VK3CFH
Secretary — Jim Wright VK3CFB
Treasurer — Harry Hekkema VK3KGL

Stan Widgery VK3SE and George Small VK3DKJ, were presented with Life Membership Certificates in appreciation of the many years of unselfish service to the club and their fellow members.

The 1987 Hamvention was very successful and, in line with club policy to use profits from Hamventions for the benefit of all amateurs, members have now built and installed a two metre repeater at Smeeton, VK3RBS. A digital repeater will shortly be installed in Ballarat and the 432 MHz beacon, which has been out of service for some years, has been updated and should be heard in the near future.

The 1988 BARG Hamvention will be held on October 30. Further details will be published later.

—Contributed by Jim Wright VK3CFB, Secretary, BARG

SHEPPARTON AND DISTRICT AMATEUR RADIO CLUB INC

The Shepparton and District Amateur Radio Club is holding a Communications Day on Sunday, September 18, 1988. The event will take place at the Shepparton Showgrounds. This venue is in the City area and only a short walk from the Shepparton Railway Station. A return train runs between Melbourne and Shepparton so, leave the car at home and enjoy V-line's comfortable country service. The train leaves Melbourne at 8.56 am and arrives in Shepparton at 12.50 pm. It departs Shepparton for Melbourne at 5.37 pm.

Major dealers have indicated they will be attending. Icom will display the "Rolls Royce" of transceivers, the IC-781, plus a full range of their equipment. Tomlinson Communications will show their Australian-made antennas. Measure Tech Supplies will have a range of Kenwood equipment.

Home-brewers may care to purchase from the large supply of secondhand and reclaimed parts! A flea-market stall will operate if required, so bring along those bits and pieces you have been meaning to sell.

A friendly two-metre fox hunt is planned so remember to bring your sniffers. If required, a tour of the city and the local potteries can be arranged. Bring along the whole family.

The greater Shepparton area was proclaimed Australia's first solar region. As a result of this, the club has changed its call to VK3SOL, for SOLar. The club award if to be re-activated and for the month of September a special one contact award is available.

This year, Shepparton is celebrating its Sesquicentennial. The club decided that an endorsed award was a good way of participating in the celebrations. A contact with AX3SOL during September will qualify you for this award. There are many special events on in the area during this month as the SHEPPtember festival is held.

On Communications Day catering will be available and there is plenty of room for a family barbeque to be set up. Why not take in some of the other activities of the area at the same time?

A Talk-In will be conducted on VK3RGV, 146.650 MHz in case you get lost. A lucky door prize will be awarded on the day. Doors open at 10 am and close around 4 pm.

For further information, contact the club at PO Box 692, Shepparton, Vic. 3630, or Peter O'Keefe VK3YF on (058) 21 6070.

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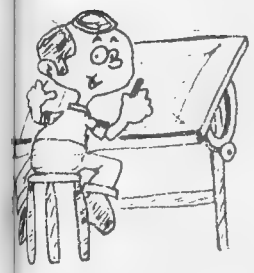
* ELECTRONIC KITS (incl DREW DIAMOND'S PROJECTS)
* RANGE OF MURATA CERAMIC FILTERS & RESONATORS



CLUB PORTRAIT

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

SHEPPARTON AND DISTRICT AMATEUR RADIO CLUB (SADARC) INC

It was with great enthusiasm that over 20 people attended a meeting on June 6, 1979, which saw the formation of this club.

But it had its early beginnings back in the 1960s when radio amateurs in the Goulburn Valley, north-central Victoria, had a net on 80 metres.

This hook-up continued for many years before interest waned and it lapsed.

In the late 1960s, the WIA journal, *Amateur Radio* featured a card insert listing two metre repeaters, including one on Mount Major, near Shepparton.

This raised some eyebrows among the locals who knew that the repeater, although listed and planned, did not exist. They were then galvanised the idea of a repeater to serve the area.

Mount Major is visible from Shepparton and the prospect of the hobby being enhanced by a repeater began to haunt local radio amateurs, but little progress was made.

In the mid-1970s, the CB radio boom was heading for its peak, and the Novice licence was introduced. Club President, Peter O'Keefe VK3YF, said; "CB radio made the general public aware of the concept of hobby communications.

"This was in stark contrast to the radio amateurs who had traditionally kept a low profile."

The local TAFE college organised several local radio amateurs to run a Novice course mainly for CBers, and this started in June 1977, ending in time for the following November examination. But despite initially attracting a large number, many gave it away fairly early leaving only eight dedicated souls determined to get the Novice ticket.

Most passed the examination at their first attempt, while the remainder were successful at their second attempt.

With the encouragement of TAFE staff, the majority then formed a self-help group with the intention of passing the AOCP.

By mid-1979, the self-helpers had achieved their aim. It seemed those who had participated formed a human bond, and wanted to continue meeting socially. The obvious way was to form a radio club. A meeting was convened at the PACE Building, in Shepparton, by Jim Scott VK3KFD, who was elected the club's inaugural president.

About 80 percent of those attending were newcomers to the hobby and full of enthusiasm. They were typical of the radio amateurs born out of the CB boom. The club's name was suggested by Frank VK3NMY, the founding secretary.

Other committee members elected were Jim VK3BNM, Barry VK3KBR, and Graeme VK3ZSQ.

Soon after its formation the club became a member of the WIA. The first organised activity for SADARC was the Jamboree on the Air (JOTA) weekend of 1979.

After an address by John Waters (who later became VK3PXJ), from the local scout district, the club members set up portable stations at local scout halls.

Striking while the enthusiasm was still running, Graeme VK3ZSQ, raised the almost forgotten issue of a local repeater. Wayne VK3XQA, speaking from CB activity experience, knew that Mount Wombat, near Euroa, and not Mount Major, was the ideal site. Mount Wombat provides access to the Goulburn Valley and southern New South Wales, and large areas of Melbourne.

After considerable volunteer effort and support, and a contribution by the WIA Victorian Division, which provided half the costs of construction materials for the repeater hut, VK3RGV, Mount Wombat, started operation in 1982.

The club has been vocal on issues affecting the hobby, and was among the first to enter the debate on future directions after the release in 1985 of the Linton/Harrison discussion paper.

Its members are keenly involved in packet radio and have set up a digipeater, VK3RPW, on Mount Wombat, to provide part of the intra-state and inter-state path for packeteers.

SADARC sees packet radio as the new frontier of amateur radio, and is voicing its opinion on the still nagging protocol hassle.

The biggest event on the SADARC Calendar-of-Events is the Communications Day, held in September. This single day activity being held this year on Sunday, September 18, takes place in the middle of the SHEPPtember festival activities sponsored by business and community groups.

Being ideally located in north-central Victoria there has consistently been high attendances from throughout the State and from southern New South Wales.

Full details of the Communications Day '88, which is also aimed at the general public, appear elsewhere in this edition of AR magazine.

"It's most important to put our hobby before the general public," Peter VK3YF said.

For that reason, SADARC members have participated in various public events, including street displays, and WICEN activities, to help with out hobby's image in the community, he said.

The club sponsors the Wombat Award, although in recent times, the wombat has been in a state of hibernation. But, with the club's new call sign, VK3SOL — very appropriate because Shepparton is Victoria's Solar City — the Wombat Award will be re-activated with possibly a solar powered flavour!

VK3SOL will have a good HF signal from an IC-730 transceiver donated by Bert Randall VK3BRR, who in recognition for his fine gift has been made the club's first life member.

SADARC is an active and progressive club willing to speak its mind on issues affecting the hobby, and play its part to further the pursuit of hobby communications.

■

QSP

AMATEUR RADIO IS THE HOBBY

A special station VE3CNE (Canadian National Exhibition) will be operating from Toronto until the September 5. The display is exhibiting all facets of the hobby. A special QSL will be forwarded to all stations contacting this station who is using the apt motto "Amateur Radio is the hobby!"

—Condensed from *The ARRL Letter* by Ken McLachlan VK3AH

■

Forward Bias

Norm Gomm VK1GN
GPO Box 600, Canberra, ACT. 2601

DIVISIONAL PARTS BOX

The Divisional Parts Box, under the care of Neil VK1KNP, is operational, but we still need suggestions for items to stock.

MONTHLY MEETINGS

The June meeting saw a presentation by Dr David Gambling from the Department of Defence's Electronic Research Laboratory. David gave us an intelligent insight into where the world of microelectronics is heading. Over 60 members attended and the number and quality of questions asked at the end was a measure of the interest shown in the topic and the speaker.

David certainly laid to rest the old myth that boffins cannot communicate.

Hank VK1HZ, is always looking for new and innovative topics. So, any suggestions will be gratefully received. Hank would prefer topics that have a strong amateur radio flavour.

Future meeting dates are:
September 26
October 24
November 28

PACKET ACTIVITIES

The packet digipeater has been installed on Mount Ginini and will be in operation by the time this goes to press. As mentioned in the previous issue, the digipeater will operate on 144.800 and 4800 baud rate.

The ACT Packet Group normally meets on the first Thursday of each month, but this is subject to variation. Details of venues and dates are beaconed by Richard VK1UE, about one week before a meeting.

Details on the ACT Packet Group activities can be obtained from Carl VK1KCM, on telephone (062) 89 7819 (work) or (062) 58 3921 (home).

DEVOLUTION OF EXAMINATIONS

The Division will be applying to run amateur examinations under the new arrangements and will be looking for people to assist in their running. Anyone interested in helping should contact a committee member. You do not necessarily have to be a full call to be able to help.

FUTURE OF AMATEUR RADIO WORKING PARTY

The Working Party is looking for an amateur in the Canberra region to assist gathering information on amateur activities. Volunteers can be non-WIA members. If you are interested please contact George VK1GB (062) 54 1985 (AH) who will fill you in on the details.

JOTA

JOTA is approaching with incredible speed and Neil VK1KNP, out JOTA co-ordinator, is looking for about six stations co-ordinators and numerous operators. Those who participated last year will recall that the scout and guide movements were really well organised making JOTA a very satisfying activity. Get in early and reserve your place in this years activity by calling Neil as soon as possible.

VK1 AWARDS NET

The VK1 Awards net is run every Sunday night immediately after the Divisional broadcast (2000 local time) on 3.570 MHz. The net controller and awards manager for this activity is Bob VK1DE. This year the net has been using the VI88ACT special event call sign, so here is your chance to kill two birds with the one stone by collecting your award and working VI88ACT.

The first award issued on October 10, 1980 went to Egil Bohn OZ4BO, and the bicentenary award No 200 went to Alec Pickford VK2EF. To date, 204 two-way and about 10 SWL awards have been issued.

Bob has asked me to make special mention of Joe VK1NDJ, and Russell VK1OP, who have been regular supporters of the net in recent times.

THOUGHT FOR THE MONTH

I was talking to an amateur the other day who was gradually losing interest in the hobby because he found it difficult to get advice or help on various aspects of amateur operations. He was a shy type which compounded the problem.

Discussing this as a general issue with a couple of other VK1s, we agreed that it was a widespread problem. We also agreed that, on the other side of the coin, a lot of experienced amateurs are equally too modest to offer their services, probably because they feel they are not expert enough.

So, there you have it! One party reluctant to ask for help, the other reticent to step forward. Who should take the first step?

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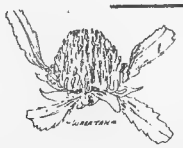

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

On June 30, 1988, Cec Bardwell VK2IR, retired from the position of Divisional Correspondence Course Supervisor. In 1960 Cec undertook to conduct a personal lecture class for the Division at the newly acquired Atchison Street property and this involvement lasted for the next 20 years. In 1961, there was a need to provide a Correspondence Course for those living in remote areas and this service has continued to the present day. There have been many thousands of amateurs, both within Australia, as well as overseas who have benefitted by the Division's courses. Margaret Bardwell has assisted throughout the Correspondence Course with the paperwork associated with the course. To you both, thank you for three decades of contribution to the Amateur Radio Service.

WICEN EVENTS

Saturday, September 19 — Batemans Bay Car Rally.
October 22-23 — Hawkesbury Canoe Classic.

POSTCODE CONTESTS

There has been a slight change in the program for the remainder of the year. September 30 — two metre SSB; October 28 — 70 cm; November 25 — two metre FM and December 30 — six metres. A report in a future issue of the scores for the first half of the year.

TRASH AND TREASURE

At 2 pm, Sunday in the car park at Amateur Radio House, September 25 and November 27.

WAGGA ARC

Wagga ARC is to conduct a Field Day on the first weekend of November. Details will be in the Club Corner notes for October.

ILLAWARRA ARS

Illawarra ARS will host the next Conference of Clubs in November. Agenda items from clubs must reach the Divisional Office by September 15. See Club postings for details.

SPECIAL EVENT STATIONS

VI88WIA will be used for the one day *Fisk Award* on September 22. See separate article this issue for details. VI88NSW will be used for the Parramatta Bicentenary Award from October 31 to December 5. Details of this award will be in October AR. VI88NSW will be active most weeks until the end of the year with various clubs and groups. There are a couple of weeks still available in December.

Don't forget to return your RD log. VK2 needs the benefit of your score.

NEW MEMBERS

A warm welcome is extended to the following who were in the July intake.

P M Broadhead VK2VBX	Bungonia
J A Burlison Assoc	Cheltenham
D S Byrnes Assoc	Regents Park
D W Chaffey VK2NBC	Chester Hill
M T Egan Assoc	Bullaburra
N C Farley Assoc	Gloucester
L O Horsfall Assoc	Newbridge
P B Marks VK2TPM	Balmain
R E Perez Assoc	Fairfield
P A Westerman VK2MPW	Wingham

ar

AMATEUR RADIO CLUBS & GROUPS LIABILITY INSURANCE

We are the sole administrators of the above group liability insurance scheme, which operates successfully in N.S.W.

SUM INSURED: $2 000 000

Join before the 15th October, 1988 to qualify for your group benefits:

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13 William Street, Fairfield, NSW. 2165

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

VK3 BROADCAST

Members of the Wireless Institute can place advertisements on the regular Sunday morning broadcast.

The Department of Transport and Communications has granted permission to operate a service for "Wanted" and "For Sale" items related to amateur radio and shortwave listening. We are not, however, permitted to broadcast the names, addresses or phone numbers of persons placing advertisements.

If you have something to sell, or if you are searching for a particular item, prepare an advertisement just as you would if you were sending it to the classified section of a newspaper. Send two copies of your advertisement together with an *Amateur Radio* address label (to confirm WIA membership) to:

John White VK3KJW
PO Box 199
Preston, Vic. 3072

Please do not send advertisements to the broadcast post office box.

If an advertisement on the broadcast interests you, contact the WIA Victorian Divisional Office on (03) 417 3535 between 10 am and 3 pm Monday to Thursday and the advertiser's full details will be supplied. (This is where the second copy goes!).

Zones, clubs and individuals are encouraged to contribute any items they consider newsworthy or of interest to radio operators or shortwave listeners.

Send material to:
Broadcast News
PO Box 260
Cranbourne, Vic. 3977

The broadcast goes to air at 10.30 am every Sunday on the following frequencies:
1.840 MHz AM; 3.615 MHz LSB; 7.085 MHz LSB; VK3RMM 7250 and VK3RWG 7225.

By this time, the Melbourne repeater VK3RML should be back on air and will carry the broadcast. While it was off air, the broadcast was carried through the Geelong repeater, VK3RGL.

The broadcast will soon be relayed through the Geelong City repeater VK3RGC. In the longer term, it is planned to relay the broadcast through VK3RNE, on Mount Big Ben in north-east Victoria. Also planned is a six metre outlet via repeater instead of the simplex frequency used in the past.

ECONOMY QSL CARDS

The Victorian Division can have a standard QSL card printed for its amateur and shortwave listener members. The very competitive price is $95 for 1000 cards.

A standard block is used, which is then personalised with your call sign or WIA listener number, and address.

Orders must be in lots of 1000 cards and to keep the price down, we need to have 4000 cards in the one print run. Orders are held until a print run can be filled.

To place an order, contact by phone or letter the WIA Victorian Division Headquarters volunteer on Tuesdays, Bruce McCubbin VK3SO.

ZONE AND CLUB NET

Don't forget the valuable club news forum available in the form of the Zone and Club Net held at 8.30 pm every Sunday evening in the vicinity of 3.597 MHz, controlled by Marilyn VK3DMS.

—Bill Trigg VK3PTW, VK3 Council

NEW MEMBERS

The following applications were received for the month of May 1988.

Lionel Decker VK3KLD; Raymond Dunstan; Rodney Flanagan VK3CR; Roger Godfrey VK3JBK; David Gothard VK3CDG; Ormond Guy VK3DGP; Mark Harris VK3KYG; Kenneth Jennion VK3VAX; Graeme Knight VK3VGK; Frederick Oakman VK3JGO; Kenji Okubo; Terence Robinson VK3DWZ; Michael Schulz DF6AR; Colin Strong VK3YCS; John Swift; Robyn Trinder VK3MBL; Robert Williams VK3VOS and Yu-Hong Zhou BY4AA.

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Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

NEW MEMBERS

I am pleased to have room in this month's column to include a list of new members who have joined in the first half of 1988. It has been our intention for sometime, to include a list of new members but I always seem to run out of space. If your name is on the list, we welcome you to the VK5/8 Division and hope that you have found your first half year enjoyable and worthwhile. If you happen to be reading your friend's copy at this moment, or are perusing the copy at your local public library, why not take the plunge and join us. We will gain by the increased membership and you will gain by joining a great bunch of people with like interests, having a magazine which keeps you in touch monthly, use of all the WIA services like the QSL Outwards Bureau (which will not be available to non-members in VK5/8 after January 1, 1989) and a united voice in things which affect amateur radio. I look forward to printing your name in out next list!

NEW MEMBERS FOR HALF YEAR 1988

C A Edwards Assoc
A G Hughes ZL3KR
D J Hobbs VK5AS
M H Hillard VK5AHH
D J Cavies VK5KOC
T J Crothers Assoc
D R Nairn Assoc
T D Niven VK5NC
A Wardhana VK5KAW
W J Pickering VK5ACY
I Parkinson VK8NIP
V E Skitterall Assoc
F A Ayling Assoc
H I Greenhill VK5NGH
R G Wake VK5KZZ
K P Thompson VK5SE
K R Browne Assoc
E Leach VK5PAG
R C Scott VK5PG
B P Mountford Student
SA Packet Users Group
R E Gunnourie VK5FI
A J Gluis VK5AAQ
K P Thomas VK5ZKS
M L Patzel VK5KMP
J R Godson VK5LV
F Rutherford W2NUS
R E Padman VK5DP
I M Benn VK8IB

DIARY DATES

Tuesday, September 27: Display of Members' Equipment (Bring along your latest piece of "home-brew" and perhaps take home a "reward" or your efforts). 7.45 pm. BGB.

Tuesday, October 25: Speaker — Mark Spooner VK5AVQ, on his recent trips to the Antarctic, and some of the technical equipment with which he was involved (slides). 7.45 om. BGB.

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Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!

AMATEUR/CINEMA INDUSTRY

A couple of years ago, via these pages, an amateur requested information from those of us amateurs who had worked as projectionists in the cinema industry. It was for a planned article on that subject and the promise was that all contributions would be acknowledged.

Like, I guess others, I sent off information about myself and other past VK6 projectionists I knew, but no reply ever came. Neither do I recall seeing the article eventuate.

I know that, like me, many VK amateurs who have spent time in a bio box would have looked forward to that article but obviously something went wrong.

If any VK projectionist, retired and present, would like to be placed on a list, I invite them to send me details of theatres and equipment they best recall plus any anecdotes or memorable experiences they care to relate. Names and call signs of silent key projectionists would also be welcome.

Please include a 9 x 4 stamped addressed envelope so that a summary of replies received can be returned in a month or two.

Paul Weaver VK6OF
23 Waddell Road
Palmyra, WA. 6157

The long-delayed article is in this issue, Paul. -Ed. ar

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THE OTHER SIDE OF THE COIN

A few time in ones life things occur which must be akin to "Heaven Sent".

Some months ago, my wife, who does wonderful things on "knitting rigs" went to a Knitting Seminar at Adelaide University. During this short period I met, among many other ladies, Margaret Grundy, from Crystal Brook. The upshot was that my wife has a surplus "rig" due to updating and Margaret decided to buy the superseded model. How to get it from Aldinga Beach to Crystal Brook was something else, but was eventually solved by John, one of Margaret's family.

John duly arrived to collect the machine, was invited in, declined a "cuppa" but stayed for a good chat. It was only then that I learned that John's father was none other than Bob VK5BG, late of Murray Bridge.

Since, I have joined the boys from that area on their net — sadly after Bob had left for new pastures — therefore I did not meet Bob at any time — my loss I fear.

Eventually, I wrote to Margaret passing on condolences and asking had she anyone in the family "radio-minded" in order to pass the call sign on and retain it — if not, with her blessing, I would be honoured to replace my "BEG" with "BG".

It is too late now to try and catch up with Bob's achievements, but if you should be listening Bob and hear your call come the Spring, I shall not be aping you — just keeping VK5BG warm.

My thanks to Margaret and her family.

73

Rick Burnell VK5BEG/BG
63 Acacia Terrace
Aldinga Beach, SA. 5173

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TECHNICAL CORRESPONDENCE

I would like to make some comments on the article *Two Metres For The Newcomer* in the July issue of AR, particularly that part of the article dealing with the expected range of ground wave communication. Table 1, as stated, takes no account of the bending of the radio wave due to atmospheric refraction. The effects of refraction are to extend the radio horizon by about 15 percent over the figures given in the table, not 30 percent as stated.

A simple formula for calculating the distance to the radio horizon is:

Distance = 4.13 x sqrt (Height)

where

Distance = distance to the radio horizon in kilometres

Height = height of antenna in metres

The height of the antenna to be used in the above formula is the height above the surrounding terrain, not the height above sea level.

In the first paragraph of the article, an example is given of finding the radio line of sight distance using Table 1. It is assumed both stations have antennas on five metre high masts, and that the stations are 45 metres above sea level, giving an antenna height at each station of 50 metres above sea level. Table 1 is then used to arrive at a radio line of sight between the stations of 50.6 kilometres, extended by 30 percent for refraction to give a line of sight distance of 66 kilometres.

This calculation is misleading in that it is only correct (except for the 30 percent refraction correction which should be 15 percent), if both stations are on a cliff top on the coast with a path across the sea between each station. It is the height above the surrounding terrain which should be used for inland stations. In this case, using the example given in this article, the radio line of sight distance between the stations is 16 kilometres, or corrected for refraction (15 percent), 18.4 kilometres.

Or using the formula given above:

Distance

= 4.13 x sqrt(5)

= 9.23 kilometres to the horizon for each station

= 18.5 kilometres between the two stations

The factor of 4.13 assumes a standard atmosphere. The actual refraction of course will vary according to atmospheric conditions and height above sea level, but these refinements are of no concern to the radio amateur.

It is hoped this will prevent some amateurs from thinking something is wrong with their systems if they do not achieve the results implied in the article. In practice, many factors affect the ground wave range and the distance computed from the formula or tables is only a rough guide and is usually a minimum distance to be expected in clear open country. The formula also does not take into account scattering of the radio wave as it grazes the horizon.

Incidentally, the same formula can be used or visible line of sight if the factor in the formula is changed to 3.57. In this case, for a person standing on the sea shore with a height of eye of 1.6 metres, the sea horizon will be 4.5 kilometres away.

Yours sincerely

Kevin L Feltham VK3ANY
PO Box 61
Port Albert, Vic. 3971

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OLDIES

Yes, we are. Take a look in July's AR for example. There are some 42 amateurs amongst those in the photographs, of those only seven would appear to be under 30 years of age. Yes, the majority of us are *OLDIES*.

Why are the majority of us oldies? Well, one reason could be letters like Clive VK2DQE's and similar ones in this and other magazines that do nothing to help. We scare all but the hardy newcomer before he even starts. We have a communication hobby, yet we must be the world's worst communicators. I personally took part in an activity recently that earned amateur radio the equivalent of two full pages in Queensland's two major daily newspapers. I was communicating. Do you?

My occupation allows me, in a few months, to meet people that are not amateurs, some are CBers, some shortwave listeners and many others often looking for an interesting and active hobby. Their ages vary from 12 through JOTA to 70 years or more. In many ways I have encouraged or given advice to many of these to study or stay with their studying to obtain a licence. It is surprising just how many still drop in to say G'Day from time to time. I was communicating. Do you?

Clive VK2DQE, in his letter, mentions most, if not all full calls are against novices obtaining two metres FM. Well, I must disagree with you Clive as I would "eye-ball" a larger number of full calls than most would and the count that I have would be more like 80 percent for novices on two metres and 20 percent, if that, against.

Clive also mentioned no incentive for the novice to upgrade now. Yes, in a very small number of novices this would be correct. Often this small percentage of novices is infirmed, elderly or without the capability to progress further and will never get a full call, no matter what "carrot" is dangled in front of them. Some are blind (incidentally, I lift my hat to any such person who does sit and obtain a full call). The reasons to upgrade to a full call are too numerous to mention now but Clive seems to forget the obvious and main reason, the one that he/she can proudly and justifiably stand up, stick out their chest and say "I did it, I got my full call".

What a thrill it is when you finally make it after all the study and hard work most of us have to put in and are able to say "We can now communicate by any means at full power with the rest of the world". Incidentally, have you noticed that novices seem to be the best communicators. Do you communicate?

Clive failed to mention that the incentive novices having two metres FM now gives to non-amateurs to obtain a novice licence, the wives, friends, parents and relatives, etc now have that incentive to know that, for a reasonably modest sum, they can buy a hand-held two metre transceiver, a small power supply and a small antenna that they can fix to the guttering of their house, or to the railing of their flat's balcony, then they too can communicate *like we communicate? ? ?*

It is about time that you, I and the rest of us started to communicate. Explain, demonstrate and, what's more, *tell* people what we do and what we are about as well as actively encourage the younger generation to participate in some way in our hobby that we find most interesting, enjoying and satisfying. For, above all, we must start *communicating* not only amongst ourselves, but even more so with the general public. It's not really surprising that people in general do not know that radio amateurs have built and launched their own satellite, assisted in emergencies, communicate around the world automatically via computers, have their own television stations, send television pictures from one side of the world to the other and many of the other exciting activities that we do. Most people think we only sit and talk to each other — some do, most don't.

This is because *we don't communicate and tell them.*

Brian Beamish VK4AHD
35 Chester Road
Eight Mile Plains, Qld. 4123

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I'M STILL AROUND!

Since coming over to this country to live in the early 60s I have read the magazine from time to time and very much enjoy following the goings on down-under. I have also been active and inactive over the years on HF and managed to keep in touch with VK and ZL, but not as much as I would have liked due to pressures of business, TVI and other forms of QRM.

I am now retired and living in a quiet area of California where QRM of all kinds is at a minimum and I am always looking for VK and ZL contacts, particularly on 10 and 15 metres. My favourite frequencies are around 28.495 and 15.225 MHz. I always get a great deal of pleasure when I find an old friend from the days before and just after WWII when I was very active in VK3 and VK5 (Northern Territory).

My purpose in writing is to say how much I enjoy reading *Amateur Radio* each month and to let my old friends and acquaintances know that I am still alive and kicking. Keep up the good work.

73

Dave Medley KI6QE
(ex-VK3MJ, VK5AE, VK3DL/W5, WA5YXA)
1450 Bayview Heights Drive
Los Osos, CA 93402

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10 METRE BEACONS

From the request in June AR by the Federal Technical Advisory Committee (FTAC) Beacon Committee, it would appear that the use of time multiplexing for Australian 10 metre beacons has already been decided. The 1985 IARU Region 3 meeting agreed to multiplexing 10 metre beacons. I wonder why? Furthermore, when did the WIA pass a resolution to adopt the IARU proposal?

The last heard of this proposal was that the matter would be open for discussion. What was the result of these discussions? This should have appeared in AR; that is what AR is for.

VK2ZTM, in his report on page 60, June 1988 AR points out the complexity of multiplexing. What advantage to the amateur fraternity of this Region is there of multiplexing 28 MHz beacons? Beacons on 14 MHz are a completely different situation and I suggest that the 14 MHz case has been used quite incorrectly to apply to 10 metres.

As I pointed out to the FTAC in October 1987, even if two stations come up on the one frequency they are:

a) likely to be up to 1 kHz or more apart due to frequency tolerance.

b) unlikely to be of equal field strength.

c) unlikely to be sending call signs at the same time and if they do, and the interference is serious, there is time for the automatic repeat, so nothing is lost.

Now, consider this, as each beacon under the multiplexing system will only radiate for one minute each 10 minutes, one will have to sit on the frequency 28.200 MHz for 10 minutes and possibly hear nothing (if there is no propagation and this is the case for most of the time) and then spend *another* 10 minutes on 28.195 MHz for other beacons. That is, a total of *20 minutes* is spent to find out what now takes me 15 seconds. Is this progress?

Perhaps FTAC would like to comment on this aspect of their proposal.

I further suggest that this proposal is going to cost the WIA a lot of time and money to make and maintain the additional equipment and the user will not benefit one bit, but will, in fact, receive a degraded service. Again I ask, is this progress?

I suggest that we can well spare for beacons 100 kHz of the 1.700 MHz available on this band to save the complication of multiplexing. Furthermore, there appears no reason why two or more beacons cannot be allocated the same frequency (for the reasons given above) if all 40 allocated channels in the 100 kHz segment are used.

While it is appreciated that the corporate body of the WIA is, in fact, the member of the IARU Region 3 (distinct from the Divisions), I suggest that it is about time that members had the opportunity for an input to IARU matters *prior* to discussion/decision. In this regard, agenda items for IARU meetings should be published in AR. Remember IARU decisions affect *all* WIA members, not just members of the WIA corporate body.

R Torrington VK3TJ
4 Thistle Street
Pascoe Vale South, Vic. 3044

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WHERE IS EVERYONE?

I hope that in writing this letter I do not show my ignorance but the subject I would like to put forward is one that I don't think has been addressed.

I have travelled to Brisbane several times via the Newell Highway and I find contacts on two metres difficult, if not impossible — repeaters are scarce and, of course, can be off the air, like RML.

The problem can happen on any highway, not just the one mentioned above. I have not read anywhere that there is a declared frequency that drivers, passengers, train travellers and bus passengers (with ear plugs) can leave their two metre unit tuned to, yet much vehicle traffic carries VHF transceivers, seemingly all on different channels. May I suggest the use of 146.500 MHz as a road channel.

Amateurs living on main highways in the country would be able to say "Hi" to the people they speak to on HF. Even our CB relatives use a road channel, but as far as I know we are not as well organised.

One could be driving behind a car or truck and not know that they were able to contact each other on 146.500 MHz because one is shouting at an out-of-reach or off-air repeater and the other is scanning at the other end of the band.

With Novices now on two metres, contacts which may also be urgent will be more easily made.

I hope that this suggestion is embraced by other travelling amateurs and make our journeys over this large country safer and more enjoyable.

Yours faithfully

Geoff Valentine VK3GV
3 Afton Court
Glen Waverley, Vic. 3150

The national two metre FM calling frequency was designated to be 146.500 MHz many years ago and is extensively used for this purpose. Once contact is established, stations then move to another frequency. —Ed.

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DX AWARDS — APPARENT COSTS

I refer to a letter in the June edition of AR from Neil Penfold VK6NE, concerning USSR awards.

I agree the "Box 88" specifies a cost of 14 IRCs or one Rouble for their awards. But I do feel that the fee for these awards has not been upgraded since before cats whiskers and kites, when IRCs were relatively cheap.

After some easy research through the local bank, I found that the exchange rate for the Australian dollar was 0.475 Rouble, or about $2.10 per Rouble. Working on this base I have been able to achieve and receive some of the above-mentioned awards.

So, about $A10.50 or US$8.00 would "fill the bill" handsomely, for the awards that Neil mentioned.

Yours faithfully

John Kelleher VK3DP
4 Brook Crescent
Box Hill South, Vic. 3128

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NOVICE DEBATE

Re the Novices on two metres debate, I found the contrast in attitudes of members as expressed in July AR very striking. On one hand we have VK3AFW taking the trouble to write and illustrate a three page article designed to assist the newcomer to two metre FM operation. On the other hand we have VK2DQE crying about being "kicked in the face" by this decision. The latter comment is on a par with a statement heard on 7.025 MHz high speed CW the other morning — "There's no way I will talk to them".

To my mind the final sentence of VK3AFW's article is in the true spirit of the amateurs' code, paragraph 4 — "friendly advice and counsel to the beginner".

Yours faithfully

Ray Jones VK7RQ
Howrah, Tas. 7018

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DOG IN THE MANGER

I gather from Clive's (VK2DQE) letter in the July issue of AR that he is very angry about the Novice two metre development.

It would be very easy to logically decimate his point of view quoting such parallels as the parable of the vineyard and 'Dog in the Manger; and be very nasty about his reference to CB standards and scarcely veiled suggestion of blackmail re his membership.

However, I have been in his position myself. Years ago I wrote a similar letter to my local council. Two days later I suddenly realised the contents would be debated at an open council meeting and reported in the local paper. In a state of near panic I arrived, white faced, at the Shire engineer's office where, without a word, he handed my letter back to me; from his coat pocket. I still write such angry, critical one-eyed letters; pour my heart out; but I never post them, if ever, for a few days. I sleep on it.

I commiserate with Clive as he penned his thoughts and I appreciate his mood, obviously occasioned by the facts he has stated. At first glance it would seem to make one "spit chips". There are many other obvious inequalities in our everyday lives that do so and about which we should be justifiably angry.

It is not my intention to criticise Clive's point of view. He is, like the rest of us, proud of his achievements, active, enthusiastic and interested in the progress of amateur radio. He is entitled to have his say.

On the other hand I wonder if he feels the same about the issue today? Have we hardworking bright sparks, we who have arrived, really lost anything?

Perhaps our Editor should allow us "sleep time" and query such outbursts prior to publication; just in case we have a change of heart.

Yours 73

Don Law VK2AIL
RMB 626 Adalong Road
Tumblong, NSW. 2729

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EDITORIAL

May I commend the Editorial (Leader?) in the July issue of AR, "Novices on Two".

I came to know two or three Novices on air as VK5NBD. Not one of them lives close enough to Adelaide to drive up to a WIA meeting, even if he came direct from work. As VK5KIC, I have lost contact with them, since, until two metres became 'common ground', we had no frequency in common because to finance (out of a gross income of under $200 a fortnight) a couple of hand-helds for VHF/UHF bands, my Novice HF equipment had to be sold. It will be very pleasant to meet with them again on air, possibly through one of the repeaters.

Before this two metre band opening how were Novice operators ever going to feel the incentive to upgrade to be entitled to use power enough to access the Crafers repeater, stationary mobile on the wrong side of the main building at Flinders Medical Centre?

On one occasion when I tried using 200 mW, another station came back with "QRZ the station calling. You were unreadable under the noise!"

I earned a report of 2 and 5, when I went up to two watts. Yes, this Limited has a *long way to go yet!*

Being able to work the Novice friends I made whilst on HF, when they get on the air, will be motivation to me to get to be one 'up there in those New Worlds to conquer'. . .

Yours sincerely

Ian Crompton VK5KIC
9 Craig Street
Richmond, SA. 5033

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in VK6 *for*

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MORSEWORD 19

© Audrey Ryan

Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

Morseword works like a crossword puzzle. It contains only one word in each row or column and each letter of that word is spelled out in Morse code. Think about the clues and then encode your answer, putting a dot or a dash in each square. For example, if the clue were **felines** the answer would be **cats** and you would write it in the grid thus:

- . - . . . - . . .

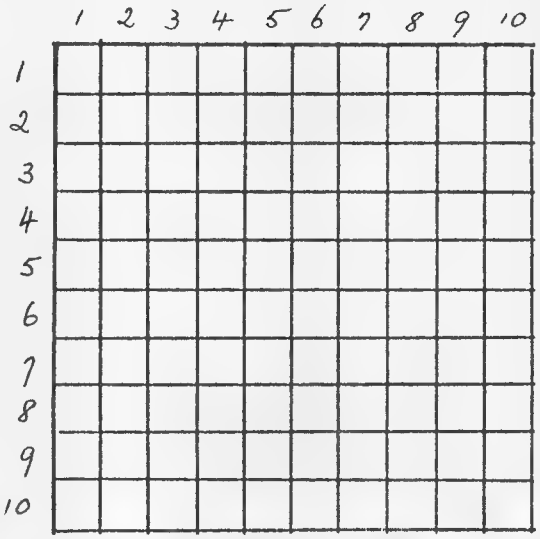
Solution page 62. . .

ACROSS

1. Solidity
2. Scottish roll
3. Smooth cloth
4. Where one's heart is!
5. Ancient
6. Annoy
7. A flower
8. . . . Lanchester, actress
9. Tarry for
10. Tarts

DOWN

1. Digs
2. Ship
3. . . . Joan, for example
4. Plunge
5. Keen
6. Demur
7. Hide
8. Monkeys
9. Confirms
10. Joint



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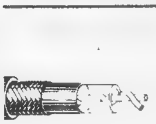	**9913** 80C	9½ (Solid) .108 bare copper .90Ω/M' 2.95Ω/km	Semi-solid Poly-ethylene .285	.724	Duobond II* + 88% tinned copper braid 1.8 Ω/M' 6.0 Ω/km 100% shield coverage	50	84%	24	78.7	50 100 200 400 700 900 1000 4000	0.9 1.4 1.8 2.6 3.6 4.2 4.5 11.0	3.0 4.6 5.9 8.5 11.8 13.8 14.8 36.1
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- **Telephone technical enquiries**
– yes, you can speak to the editorial team direct and have your queries answered. We don't live in an ivory tower!

Silent Keys

It is with deep regret we record the passing of:

MR G H CARRUTHERS	VK2BGC
MR J J S (JACK) FERRIS	VK2NC
MR FRANK G IZON	VK2DQX
MR GEORGE THOMAS SLAWSON	VK2AFN
MR ERIC SMITH	VK2NWV

Obituaries

ERIC K CHIPPINDALL VK4XR

It is with deep regret that the passing of yet another amateur from the pre-war period be recorded. In the midst of a full and active life, Eric (Chippy) VK4XR became a Silent Key, suddenly, at his home on June 10, 1988, aged 72 years.

Eric's interest in radio began in the early 1930s when he built a 2-toober (O-V-1) and heard amateurs in QSO. The 'bug' bit and he declared, "That's for me!" During the next half-century his interest never waned. Together with most of his contemporaries home-brewing was an important activity during the pre and post WWII years.

He obtained his BOCP very early and entered commercial broadcasting, working at various 'B' Class Stations. Articulate and blessed with a beautiful, clear resonant voice his talent was soon in demand as an announcer as well as a technician. His 20 years spent at 4LG Longreach, Queensland, covered the war years, during which time he gave valuable assistance as Radar D/F Operator to the US AF Bomber Squadron based there.

Eric finally left commercial broadcasting, then successfully operated a retail grocery store for 11 years in Brisbane prior to retirement. In his later years he was very active and busy with charity work, viz Crossroads, Meals on Wheels, Red Cross and his Church, as well as amateur radio. The suddenness of Eric's demise, in the midst of all this activity, must serve as a reminder that no one has a mortgage on tomorrow.

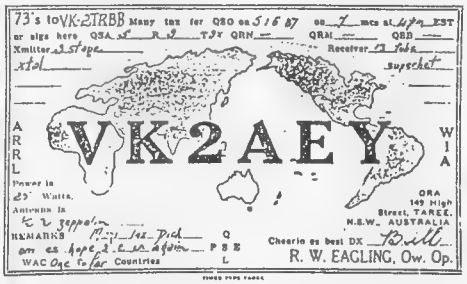
A long time member of the WIA, VK4XR was also a member of the Wide Bay Club and a Scout master in the area during the 1960s. He was tremendously popular and the fraternity will be much poorer for his passing.

After nearly 50 year of marriage (an accomplishment in itself), he is survived by his YF Jean, son Robert and daughters Jeanette, Dianne and Erica.

May this writer pay his respects to the late 'Chippy' in the manner I know best:

"Old Hams never die,
They simply QSY,
Old soldiers may just QSB,
But the Ham's appointed place
Is on a higher frequency,
Where DXers need no mode, rig
To communicate a sig
Where QRN and static rife
Is absent — as is QRM,
Cause of such ignoble strife.
—And while on Earth ops contemplate
They, from 'up the log' await
On the infinite band.
Where DX is eternal,
To greet their kin in friendship grand."

—Contributed by Alan Shawsmith VK4SS



REGINALD WILLIAM EAGLING VK2AEY

Passing of Radio Pioneer "Taree Bill"

1911-1988

The passing of Bill closes a chapter on the history of the Manning's early days of radio.

Bill Eagling arrived in Taree in 1931 and has virtually been connected with district ever since. He married Hazel in 1934 and they had four children.

From 1930 to 1950, Bill was occupied in the radio repair industry. Because of his expertise and interest in the field of radio, he obtained a "Radio Experimenter's Licence" in 1936 and became Taree's first amateur radio operator. He made his early transmitters and receivers from parts he scrounged from his radio junk box.

He served for five years with the Royal Australian Air Force during the war years as an instrument fitter, holding the rank of Sergeant. On the cessation of hostilities he was active in the formation of the Taree Returned Soldiers Services League (RSSL). Bill was involved in the establishment of Radio 2RE in the early 50s — an extension of his radio interest that was retained throughout his life.

When single sideband (SSB) was introduced Bill was one of the first to become involved and his signal was always crisp and clear. In the early days of the Civil Defense network, (now the SES) Bill and his radio equipment were a very important adjunct to the communication section. His expertise in those early days contributed to the high esteem in which the local SES is held today.

After many years in the radio field, Bill branched into pest exterminating and operated from his home. Without casting aside his interest in radio he became absorbed in the hobby of prospecting and the mining of precious stones which led him to Lightning Ridge after the death of Jean about 11 years ago.

It was at the Ridge in 1978 that Bill met and married Alma. Following some years together on the opal field, Bill and Alma retired to Manning Point, where they lived happily until Bill's recent illness. Bill passed away on June 21, 1988 aged 76 years, leaving Alma, his four children and their families together with many friends to mourn his loss.

—G Hunziker VK2BGF

MURRAY BLOOMFIELD VK3DOV

The Land Forces Amateur Radio Group mourns the passing of Murray on June 19, 1988. Murray was elected Treasurer at the inaugural meeting of the group in January 1986 and subsequently succeeded the President, John VK1NCO, when John was transferred to Perth by the Army. He was a most enthusiastic member and rarely missed the weekly on-air meetings.

Although suffering ill health, he was always cheerful and his infectious laugh will be remembered by all who knew him.

Murray served pre-WWII in the Royal Melbourne Regiment as a part-time soldier when working with the State Savings Bank of Victoria. On the outbreak of war, he volunteered for the AIF but was medically classified as unfit for infantry service. He transferred to the Cipher section, then in its infancy, and served in the Pacific area including a time at Merauke which was then in Dutch New Guinea.

Deepest sympathy is extended to his wife, Gwen, and to his family.

Bob Jackson VK7NBF

ar

ANSWER TO MORSEWORD 19

Across: 1 mass 2 bat 3 satin 4 home 5 old 6 rile 7 aster 8 Elsa 9 await 10 pies

Down: 1 mines 2 boat 3 saint 4 dive 5 eager 6 jib 7 skin 8 apes 9 agrees 10 hip

	1	2	3	4	5	6	7	8	9	10
1	—	—	·	—	·	·	·	·	·	·
2	—	·	·	·	·	—	·	—	—	·
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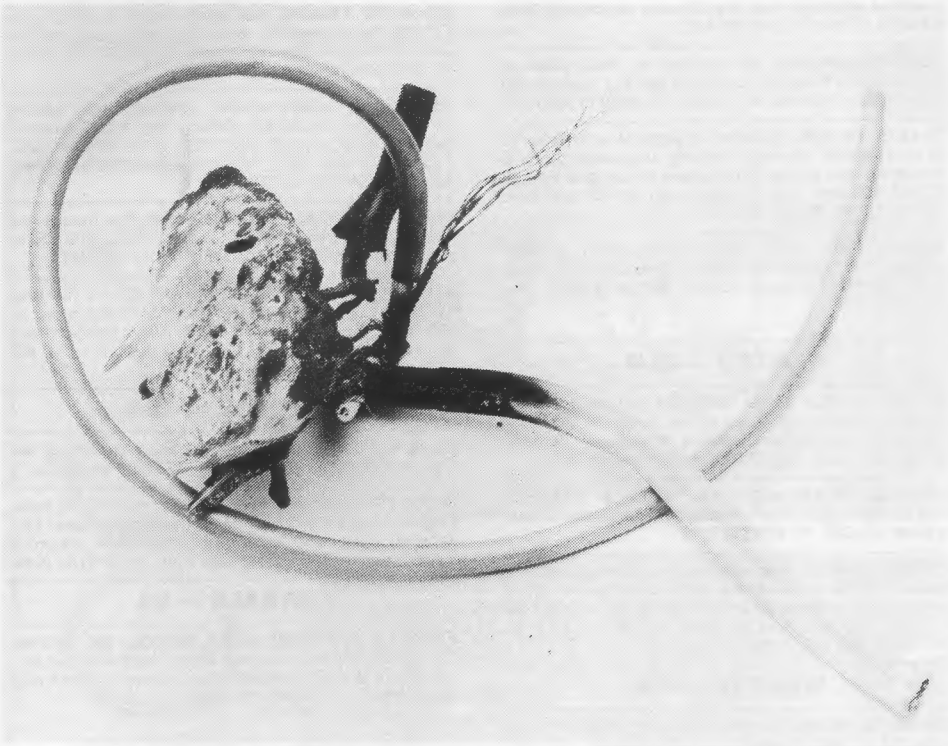
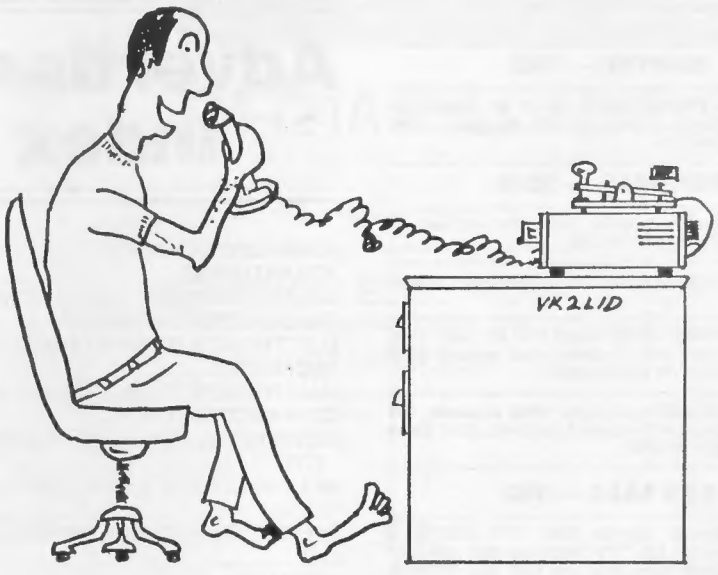
9	·	—	·	—	—	·	—	·	·	—
10	·	—	—	·	·	·	·	·	·	·

THIS USED TO BE A HOUSEHOLD POWER-POINT!

This incredible mess used to be a household power socket before someone made a slight wiring modification. The overload generated a lot of heat which melted the socket, scorched the wiring and badly smoke-damaged the room. The State Electricity Commission of Victoria says it could have easily resulted in a house fire. Interfering with household wiring is not only dangerous, but it is illegal in Victoria and most other Australian States and Territories.

—Photograph courtesy State Electricity Commission of Victoria





"No — I'm only barefoot, OM!"

—VK2COP

IONOSPHERIC SUMMARY

The Solar Geophysical Summary from IPS Radio and Space Services for the month of May contains the following information.

The monthly values were 10 centimetre flux 115.4; sunspot number 59.7; A Index 10.8; I Index 65.5 and number of flares 8.

Class M flares occurred on May 17, 20, 23, 26, 27, 28, and 29. On May 26, there were two flares.

Solar activity was moderate during the second half of the month with the small M Class flares previously mentioned. The largest, an M6 flare, occurred on May 17, and caused a daylight fade-out from 1927 to 2205 UTC.

The solar flux for the month varied between a low value of 101 from May 15 to 17, up to a high of 145 on May 31. The monthly averaged value was down a little on that observed last month.

The geomagnetic field was active to minor storm levels between 0600 and 1200 UTC on May 5. A major disturbance started after 2100 UTC on May 5, and the field was at major storm levels throughout May 6. During the interval 090 to 1200 UTC, the planetary K Index reached a value of 9 indicating extremely disturbed conditions.

The geomagnetic field was active to minor storm levels for much of May 17. The most disturbed period was observed around 1200 to 1500 UTC. The disturbance persisted into May 18, but weakened in severity. On May 30, the field was at active levels at times during the day. May was mostly quiet except for the intense storm on the 6th. An Aurora sighting was reported from Flinders Island during this disturbance.

MUFs were depressed at times during May 7 and into May 8.

The ability of the ionosphere to reflect HF signals is determined by the density of electrically charged articles present in the ionosphere. This depends on the amount of extreme ultraviolet light coming from the sun, a quantity which depends on the details of the solar cycle.

The response of the ionosphere to the variation of the solar cycle is often described by an ionospheric index. The index used by IPS is called the T index which can be thought of as being an effective sunspot number, that is the sunspot number for which the ionosphere appears to be responding.

The following table gives a comparison between the 10 cm flux and sunspot number.

SUNSPOT NUMBER	10 cm FLUX
0	67
20	78
40	93
60	110
100	147
150	195
200	243

—Contributed by Frank Hine VK2QL

WARRANTY AND INDEMNITY

Each advertisement is accepted for publication on the condition that the advertiser and/or advertising agent warrant to the Publisher that the matter within the advertisement in no way contravenes State or Federal legislation, copyright or trademark laws or any other statute, regulation or law whatsoever. The advertiser and advertising agent both jointly and each severally indemnify the Publisher, his agents and officers against all claims, demands, penalties, liabilities and damages of any nature however caused, including negligence or otherwise on the part of the Publisher or his agents and officers. Acceptance of the advertisement for publication shall be understood to be in consideration for the granting of this indemnity which shall be implied in the submitting of each advertisement for publication without the execution of any other document.

DEADLINE

All copy for inclusion in the **NOVEMBER 1988** issue of *Amateur Radio,* including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162,** at the latest, by **9 am, September 16, 1988.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 millimetre SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

RADFAX2: Hires radio facsimile Morse & RTTY program for IBM PC/XT on 360K 5.25" floppy + full Doc. Need CGA joystick port SSBhf FSK/Tone decoder. Has realign auto-start view save print + +. Also "RF2HERC" same as above but suitable for Hercules card. Programs are $30 each — $3 postage ONLY from M Delahunty, 42 Villiers Street, New Farm, Qld. 4005. Ph: (07) 358 2785.

TANDY COCO OWNERS: Grosvenor Software (G4BMK) now available in Australia. AX-25 $90 (no TNC required), RTTY/ASCII $39.50, AMTOR $82, CW $37, SSTV (Rx) $39. Details from Dave Ralph VK4ASB, 23 Darwin Street, Aspley, Qld. 4034. Ph: (07) 263 3872 AH.

FREE — SA

COMPLETE SETS OF *AMATEUR RADIO:* 1964-1986. John VK5GY. Ph: (08) 263 5419.

WANTED — NSW

CIRCUIT DIAGRAM: for Galaxy III (three) transceiver. Will pay cost if photocopied. Contact Jim VK2VJ, 56 Bungalow Road, Roselands, NSW. 2196. Ph: (02) 750 0985.

HANDBOOK & CIRCUIT DIAGRAM: for Yaesu FT-202 (a photocopy will do). Ready to pay expenses. Bruno VK2BPO, QTHR. Ph: (02) 713 1831.

TELEQUIPMENT D-65 or D-66 CRO: Power transformer wanted or defunct chassis for salvage of same. John VK2ZJF. Ph: (02) 969 4539.

WANTED — VIC

LINEAR AMPLIFIER: Suitable to couple up to Kenwood TS-820S. Must be in good order. TL-922 or similar preferred but any good performer will be considered. Alan Bergman VK3CHX. Ph: (03) 848 8443 7 pm to 9 pm (home QTH) or (03) 489 1688 Mon to Fri 8 am to 6 pm (work QTH).

MANUALS: TM-11863 & TM-11858 for ex-military communications receivers R-391 & R-392. These receivers were originally made by Collins radio in the US. Prefer original books but copies okay. Terry VK3DWZ, QTHR. Ph: (054) 27 1574.

SEMATRICS: or copy of Owners Manual for Doro 721 telephone answering machine. All costs reimbursed. Write to VK3YJ, QTHR. Ph: (03) 398 4192.

TRANSCEIVER: with full coverage rx. Must cover all WARC bands. Required for mobile use but separate AC power supply desirable. Ian VK3GE. Ph: (059) 71 3020 AH.

TS-430S, TS-140S: equivalent or better. Must include PS. Rx to be general coverage including all amateur bands to 10 metres. Also require ATU capable of tuning tx through 66 foot 450 ohm line into centre fed 66 foot ant. Bern VK3FN, QTHR. Ph: (03) 306 7227.

VALVES: Types 6K7G, 6K8G, 6U7G, 6R7G, KTW62, KTW63, X66. Needed to complete renovation of R1155 communications receiver. Contact George VK3XEC. Ph: (03) 728 3597.

WANTED — QLD

19 TYPE 2 VOLT 6 PIN BATTERY VALVE: for WWII invasion tcvr. Also impedance details of Woden UMI, UM2 modulation transformers. VK4EF, 97 Jubilee Terrace, Bardon, Qld. 4065. Ph: (07) 366 1803 AH please.

KENWOOD AT-130 ANTENNA TUNER & TRAPPED VERTICAL: Hygain 18AVT, Hustler 5BTV or similar. Details to Geoff VK4CET. Ph: (077) 73 7179.

QST OLD ISSUES: Wanted to complete Gympie Amateur Radio Club technical library 1939 onwards. All offers gratefully received now or at Goldfest 88. We may be able to swap. Secretary Alan VK4BWG, QTHR. Ph: (071) 83 1127 or PO Box 384, Gympie, Qld. 4570.

WANTED — WA

SIX-METRE TRANSCEIVER: Icom type IC-560 or IC-505 (with FM option), in good working condition. Will pay reasonable market price. Allen VK6ZTA. Ph: (09) 448 0097 or write with details to 12 Kestral Street, Karrinyop, WA. 6018.

WANTED — TAS

ICOM IC-471A TRANSCEIVER: 70 cm all mode rig or similar. Contact Derek Mitchell VK7ZRR. Ph: (002) 43 8000 BH or (002) 43 6427 AH.

FOR SALE — NSW

FT-901DM: in perfect condition $1250. Mic and manual. VK2DTH, QTHR. Ph: (076) 76 3153.

ICOM IC-505: Zero use. $550. VK2IS, QTHR. Ph: (066) 52 3376.

MINIATURE HYBRID QUAD: Model HQ1 HF beam for 6, 10, 15, 20 m. 6 dB gain. Suitable small property. $250 ONO. Leo VK2VUB. Ph: (02) 344 8887.

TEN TEC DELTA 580: solid-state, 100W, all bands, CW filter, digital readout, with manual & hand mic. $600. Steve VK2MSA. Ph: (02) 602 2085.

FOR SALE — VIC

ACITRON SSB-400: 160-10m $345. TTY MOO-75 + punch $40. Tape Dist $20. TTY CRO tester $20. AWA N&P type A5 $85. Heath Audio Anal type M48. $85. VK3BOB. Ph: (03) 578 7441.

DRAKE HF TRANSCEIVER TR-7: with service manual. $1100. VK3DVD. Ph: (03) 726 7137.

FRG-7: Excellent condition $220. Tower 50 ft crank-up plus specs $500 ONO. 5 & 8 el 2m Yagis $45 & $65. PWR trans 240V primaries with secs 6V to 920V. Offers! Two DSE 20W amp modules built — unused & hundreds new components & bits. Call for prices. Barry VK3DKS. Ph: (058) 21 0885.

ICOM IC-290A ALL MODE 2M MOBILE RIG: used as base station only. Large digital display. 10W output, ANL, AGC, scanning mic, 5 memories, dual VFO, includes mobile cradle, manual, $575. Yaesu FT-690 6m all mode in original packing, carry strap, power cable, manual. Hardy used. $425. Roger. Ph: (051) 56 8291.

KENWOOD TH-215A HAND—HELD 2M TRANSCEIVER: with STD antenna plus 3/8 & 5/8 antenna, speaker, mic, BP1-BP2x2 & BP4 battery packs. 1 hr Kenwood charger soft case. Cost $1023, sell lot for $750. Mint condition. VK3GV, QTHR Glen Waverley. Ph: (03) 560 3773.

KENWOOD TS-440S: plus power supply & aerial tuner EAT300. New condition, tested but never used, $2000. John VK3KZC, 15 Gilsenan Street, Paynesville, Vic. 3880. Ph: (051) 56 6110 AH.

MICROWAVE COMPONENTS: Coax semi-rigid, various short lengths, SMA-SMA, SMA-N, from $4. Circulators-Isolators SMA, 2.1-2.3 GHz $25. 2.97-3.56 GHz $40. 7.13-8.5 GHz $40. SMA, PCB connectors $12. All as new. Bob Flack. Ph: (03) 232 5720.

UHF COMMERCIAL TRANSCEIVERS: Pye Europa 458 MHz. $30. Plessey MTR55 482 MHz. $60. STC Radiophone $30. Tony VK3ZMP, QTHR. Ph: (03) 700 5447.

YAESU FT-101B TRANSCEIVER: with 600 Hz CW filter, $425. Yaesu FTV-650B 6m transverter $125, or the pair for $500. (Compare that to a TS-680S). Above complete with all cables, handbooks etc. VK3ARY, QTHR. Ph: (03) 807 4798.

FOR SALE — QLD

TOWER: Steel triangular, self-supporting approx 33 feet high. Brisbane area. Geoff. Ph: (077) 73 7179 for details.

YAESU FT-707 TRANSCEIVER: YM-36 mic, FC-707 tuner. Original condition $750. Dick Smith assembled keyer $25. Imported tuner 1200 watts never used $200. Kenwood QR666 comm rx $60. All manuals. Noel. Ph: (075) 53 2832.

FOR SALE — SA

PALOMAR ENGINEERS NOISE BRIDGE: $80. Kyoritsu FET VOM K200 $80. Kenwood MC45 Touchtone pad mic. $50. Oscablock SWR200 $60. Coax sleeve 2 kW 1:1 ATN Balun. $20. Gary. Ph: (08) 370 9196.

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KENWOOD

TM-221A THE ROVING NOVICE RIG

The new standard in mobile transceivers by which all others will be judged.

The new TM-221A 2-m and TM-421A 70-cm FM mobile transceivers have been specifically designed to condense maximum performance and operating convenience into an ultra compact package, allowing maximum flexibility in automotive installations.

In addition convenient key features include a large new easy-to-read LCD display, digital VFO with frequency step size selection, 14 multi-function memory channels, extended frequency coverage, pre-programmed automatic offset (TM-221A), memory scan and programmable band scan, memory shift function, and others for ease of operation and added versatility. An optional multi-function handset remote controller RC-10 is also available, further extending flexibility.

TM-721A FULL FEATURED DUAL BANDER

The TM-721A is designed to condense maximum performance and operating convenience into an ultra-compact die-cast chassis, providing an all-powerful signal in VHF and UHF operations. An optional multi-function handset remote controller RC-10 is also available, further extending flexibility of operation.

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

YOUR DEALER BELOW WILL GUARANTEE SATISFACTION

Further, beware of leaders not listed in this advertisement who are selling Kenwood communications equipment. All Kenwood products offered by them are not supplied by Kenwood Electronics Australia Pty. Ltd. and have no guarantee applicable.

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- EMTRONICS – 94 WENTWORTH AVENUE, SYDNEY (02) 211 0988
- REG STOCKMAN COMMUNICATIONS – CNR BANOCKBURN ROAD & SHIRLEY STREET, INVERELL (067) 22 1303
- ROBERTSON ELECTRONICS – 62 DESMOND STREET, CESSNOCK (049) 90 7908
- MACELEC PTY. LTD. – 99 KENNY STREET, WOLLONGONG (042) 29 1455
- ALEX JOHNSON – 19 BANKSIA STREET, O'CONNOR, A.C.T. (062) 47 9125
- DX ENGINEERING – 158 GRANITE STREET, PORT MACQUARIE (065) 84 9922
- FRANK BOUNDY – LISMORE (066) 86 2145
- CAPTAIN COMMUNICATIONS PTY. LTD. – 28 PARKS STREET, PARRAMATTA (02) 633 4333

INTERSTATE

VIC.:
- MEASURE-TECH SUPPLIES PTY. LTD. – 614 SOUTH ROAD, MOORABBIN (03) 553 4566
- EMTRONICS – SHOP 5 TO 7, 288-294 QUEEN STREET, MELBOURNE (03) 670 0330
- BRIAN STARES – 11 MALMSBURY STREET, BALLARAT (053) 39 2808
- SUMNER ELECTRONICS – 78 KING STREET, BENDIGO (054) 43 1977

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- MARINE & COMMUNICATION – 19 CHARLES STREET, LAUNCESTON (003) 31 2711
- V.K. ELECTRONICS – 214 MOUNT STREET, BURNIE (004) 31 7733

QLD.:
- MITCHELL RADIO CO. – 59 ALBION ROAD, ALBION (07) 357 6830
- EMTRONICS – 416 LOGAN ROAD, STONES CORNER, BRISBANE (07) 394 2555

S.A. & N.T.:
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W.A.:
- WILLIS ELECTRONICS – 165 ALBANY HIGHWAY, VICTORIA PARK (09) 470 1118
- BAY RADIO – 22 GRACE STREET, FERNDALE (09) 451 3561
- FORD ELECTRONICS – UNIT 19, 70 ROBERTS STREET, OSBORNE PARK (09) 242 1766

WITH ALL THE FEATURES IN ICOM'S NEW MOBILE TRANSCEIVERS, IT'S A WONDER THEY'RE STILL MOBILE.

Icom have packed so many functions into the IC228A and IC3210A mobile transceivers, you'd think there was no way you could still make them so compact. (It might explain why nobody else has made a transceiver with so many features.)

Some of the features both transceivers share is the multi-colour LCD display for easy viewing. Orange, red and green highlight the numbers and letters displayed in black.

There are various power outputs across the range, from 25W to 45W.

For novices, the 228A can be reduced to 10W.

The Programmed Scan function scans all frequencies between two programmable scan edge frequencies, while the Memory Scan function scans all memory channels in succession, except, of course, those you lock out.

Thanks to the pocket beep, you'll never miss a call. By installing a UT-40 Tone Squelch Unit (this is sold separately) the transceiver functions as a pager. When the frequency of a received tone equals the tone frequency you set, a thirty second alarm is emitted over the speaker.

As for monitoring the input frequency when you work a repeater, that's as simple as pushing the Monitor Switch on the front panel to open the squelch and check the frequency.

Every five seconds, Priority Watch monitors the Call Channel, one or all memory channels in succession. And that's while you operate! No longer do you have to flip back and forth between frequencies.

While the IC228A has 20 memory channels, the more advanced IC3210A has 40. Each channel stores all the information required to work a repeater.

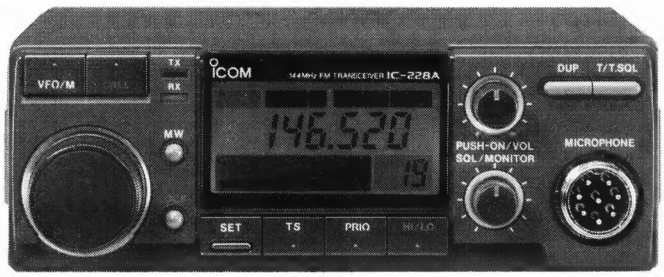
With the IC3210A, there are 20 double-spaced memory channels for 2 metres and 70 cm.

What's more, the IC3210A offers full duplex facility. Which means you can now simultaneously transmit on one band and receive on the other. You never have to wait for a long "over". You have full "break in". In fact, you can talk as easily as talking over the phone.

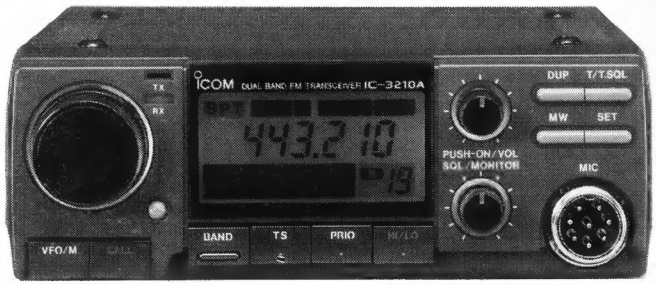
Call (008) 338 915 for your nearest Icom stockist today. (The telephone conversation in itself is a very good example of IC3210A's duplex facility.)

With all these functions in one small compact mobile, it really is a wonder they're still so compact and mobile.

ICOM



IC-228A



IC3210A

The Ball Partnership ICO 0023

VOL. 56, No 9, SEPTEMBER 1988

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